ORDER NO. KM40107719S1
F1

Service Manual

Telephone Equipment

KX-TC1710CB / KX-TC1740CB

900MHz Digital Cordless Phone
(for Canada)

Please use this manual together with the original service manuals mentioned below.

© 2001 Kyushu Matsushita Electric Co., Ltd. All rights reserved.
Unauthorized copying and distribution is a violation of law.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt tp service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Note: Supplement-1 have already supplied with printed matter. So please refer to that.

Panasonic

1. REPLACEMENT PARTS LIST

Reason for Change	The following reasons (1-8) are indicated in the **Notes** below.
1. Improve performance	
2. Change of material or dimension	
3. To meet approved specification	
4. Standardization	
5. Addition	
6. Deletion	
7. Correction	
8. Other	

Interchangeability Code	The following interchangeabilities (V-Z) are indicated in the **Notes** below.	
	Parts / Set Production	Description
V	Original / New → Early (before change) / Late (after change)	Original or new parts may be used in early or late production sets. Use original parts until exhausted, then stock new parts.
W	Original / New → Early (before change) / Late (after change)	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.
X	Original / New → Early (before change) / Late (after change)	New parts only may be used in early or late production sets. Stock new parts.
Y	Original / New → Early (before change) / Late (after change)	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
Z	Other	

(For KX-TC1710CB)

Ref. No.	Part No.		Part Name & Description	Pcs / Set	Implementation	Suffix	Not
	Original	Supplement-2					
Base Unit							
IC701	PQVI16559ABF	PQVI16559ABJ	IC	1	Nov. 00	E → F	8

(For KX-TC1740CB)

Ref. No.	Part No.		Part Name & Description	Pcs / Set	Implementation	Suffix	Not
	Original	Supplement-2					
Base Unit							
R120	ERJ3GEYJ154	ERJ3GEYJ104	Resistor, 100k Ω *1	1	Aug. 99	A → B	1
R121	ERJ3GEYJ154	ERJ3GEYJ104	Resistor, 100k Ω *1	1	Aug. 99	A → B	1
R122	ERJ3GEYJ682	ERJ3GEYJ472	Resistor, 4.7k Ω *1	1	Aug. 99	A → B	1
C115	PQCUV1H104ZF	PQCUV1H154KR	Capacitor, 0.15 μ F *1	1	Aug. 99	A → B	1
C116	PQCUV1H104ZF	PQCUV1H154KR	Capacitor, 0.15 μ F *1	1	Aug. 99	A → B	1
IC701	PQVI16559AAF	PQVI16559AAJ	IC	1	May. 00	B → C	1
IC701	PQVI16559AAK	PQVI16559AAL	IC	1	Nov. 00	C → D	8
Handset							
IC901	MN101C10AKC1	MN101C30AKA1	IC	1	Jul. 00	A → B	1

Note:

1. Parts with *1 marking have been changed at the same time.

H / KXTC1710CB-L4 / KXTC1740CB /

ORDER NO. KM49906421C1
F11

Service Manual

Telephone Equipment

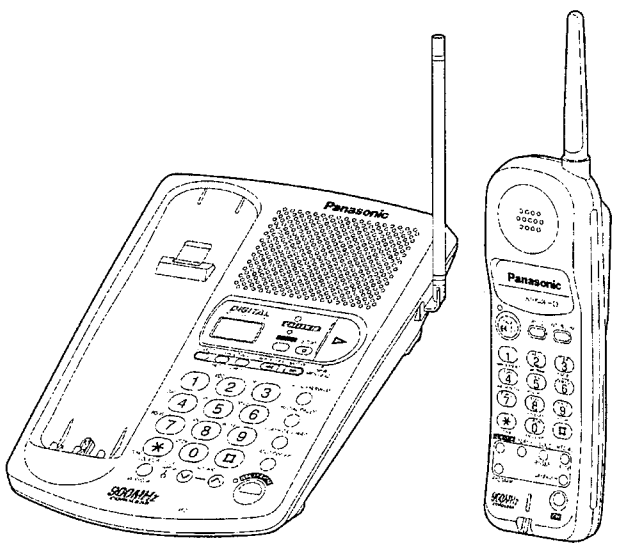
KX-TC1740B

Caller ID Compatible

900MHz Cordless Answering System

Black Version

(for U.S.A.)



(Base Unit) (Handset)

SPECIFICATIONS

	Base Unit	Handset
Power Source:	AC Adaptor (PQLV1Z)	Rechargeable Ni-Cd battery
Receiving Frequency:	30 channels within 926.1~927.55 MHz	30 channels within 902.1~903.55 MHz
Receiving Method:	Double super heterodyne	Double super heterodyne
Transmitting Frequency:	30 channels within 902.1~903.55 MHz	30 channels within 926.1~927.55 MHz
Oscillation Method:	PLL synthesizer	PLL synthesizer
Detecting Method:	Quadrature Discriminator	Quadrature Discriminator
Tolerance of OSC Frequency:	±3.6 kHz	±3.6 kHz
Modulation Method:	F3 (frequency modulation)	F3 (frequency modulation)
ID Code:	20-bit	20-bit
Greeting Message and Incoming Message:	Full digital recording Total recording time, 15 minutes	
Dial Mode:	Tone (DTMF)/Pulse	Tone (DTMF)/Pulse
Redial:	Up to 30 digits	Up to 30 digits
Speed Dialer:	Up to 22 digits	Up to 22 digits
Power Consumption:		21 days at Standby, 8 hours at Talk
Dimension (H × W × D):	2 6/32" × 6 1/2" × 8 15/32" (55 × 165 × 215 mm)	9 9/16" × 2 8/32" × 1 5/8" (243 × 53 × 40 mm)
Weight	0.93 lbs. (420 g)	0.55 lbs. (250g) with battery

Design and specifications are subject to change without notice.

Panasonic

© 1999 Kyushu Matsushita Electric Co., Ltd. All rights reserved. Unauthorized copying and distribution is a violation of law.

KX-TC1740B

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you mention the serial number, write down all 11 digits. The serial number may be found on the label affixed to the bottom of the unit.

FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.
When replacing, the following precautions will help prevent recurring malfunctions.
1. Cover the plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on the workable.
4. Do not grasp IC or LSI pins with bare fingers.

CONTENTS

	Page
1 STANDARD BATTERY LIFE	3
2 LOCATION OF CONTROLS	4
3 CONNECTION TO A TELEPHONE LINE	8
4 DISASSEMBLY INSTRUCTIONS	9
5 ASSEMBLY THE LCD TO P.C. BOARD	10
6 ADJUSTMENT	12
7 HOW TO CHECK THE RF UNIT	19
8 CPU DATA (Base Unit)	21
9 CPU DATA (Handset)	22
10 EXPLANATION OF CPU DATA COMMUNICATION	23
11 FREQUENCY TABLE (MHz)	25
12 HOW TO REPLACE FLAT PACKAGE IC	26
13 TERMINAL GUIDE OF ICS, TRANSISTORS AND DIODES	27
14 FOR SCHEMATIC DIAGRAM	28
15 CIRCUIT BOARD (Base Unit)	29
16 SCHEMATIC DIAGRAM (Base Unit)	31
17 SCHEMATIC DIAGRAM (Handset)	33
18 CIRCUIT BOARD (Handset)	35
19 BLOCK DIAGRAM (Base Unit)	37
20 NEW CIRCUIT OPERATION (Base Unit)	38
21 BLOCK DIAGRAM (Handset)	50
22 NEW CIRCUIT OPERATION (Handset)	51
23 TROUBLESHOOTING GUIDE	53
24 CABINET AND ELECTRICAL PARTS (Base Unit)	58
25 CABINET AND ELECTRICAL PARTS (Handset)	59
26 ACCESSORIES AND PACKING MATERIALS	60
27 REPLACEMENT PARTS LIST	61

1 STANDARD BATTERY LIFE

After your Panasonic battery is fully charged;

While in use (TALK)	Up to about 8 hours
While not in use (Stand-By)	Up to about 21 days

- Battery life may be shortened depending on usage conditions, such as viewing the Caller ID Caller List, and ambient temperature.
- **Clean the handset and base unit charge contacts with a soft, dry cloth once a month. Clean more often if the unit is subject to grease, dust or high humidity.** Otherwise the battery may not charge properly.
- If the battery is fully charged, you do not have to place the handset on the base unit until "Recharge" is displayed and/or "[▮]" flashes. This will maximize the battery life.
- The battery cannot be overcharged.

Stand-by mode (The handset is off the base unit.)

The handset goes into the stand-by mode after you finish using the handset (making/answering a call, viewing the Caller List, etc.). The display is blank, but the handset can receive calls. The battery life is conserved in this mode.

Battery strength

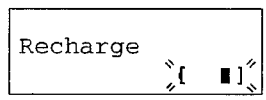
You can check the present battery strength on the display while the handset is on the base unit, while it is in use (making/answering a call etc.), or after viewing the Caller List, programming. etc.
The battery strength will remain for 5 seconds after using the handset, then the display will return to the stand-by mode.

The battery strength is as shown in the chart below.

Display prompt	Battery strength
[▮▮▮]	Fully charged
[▮▮]	Medium
[▮]	Low
[▮] (flashing)	Needs to be charged.

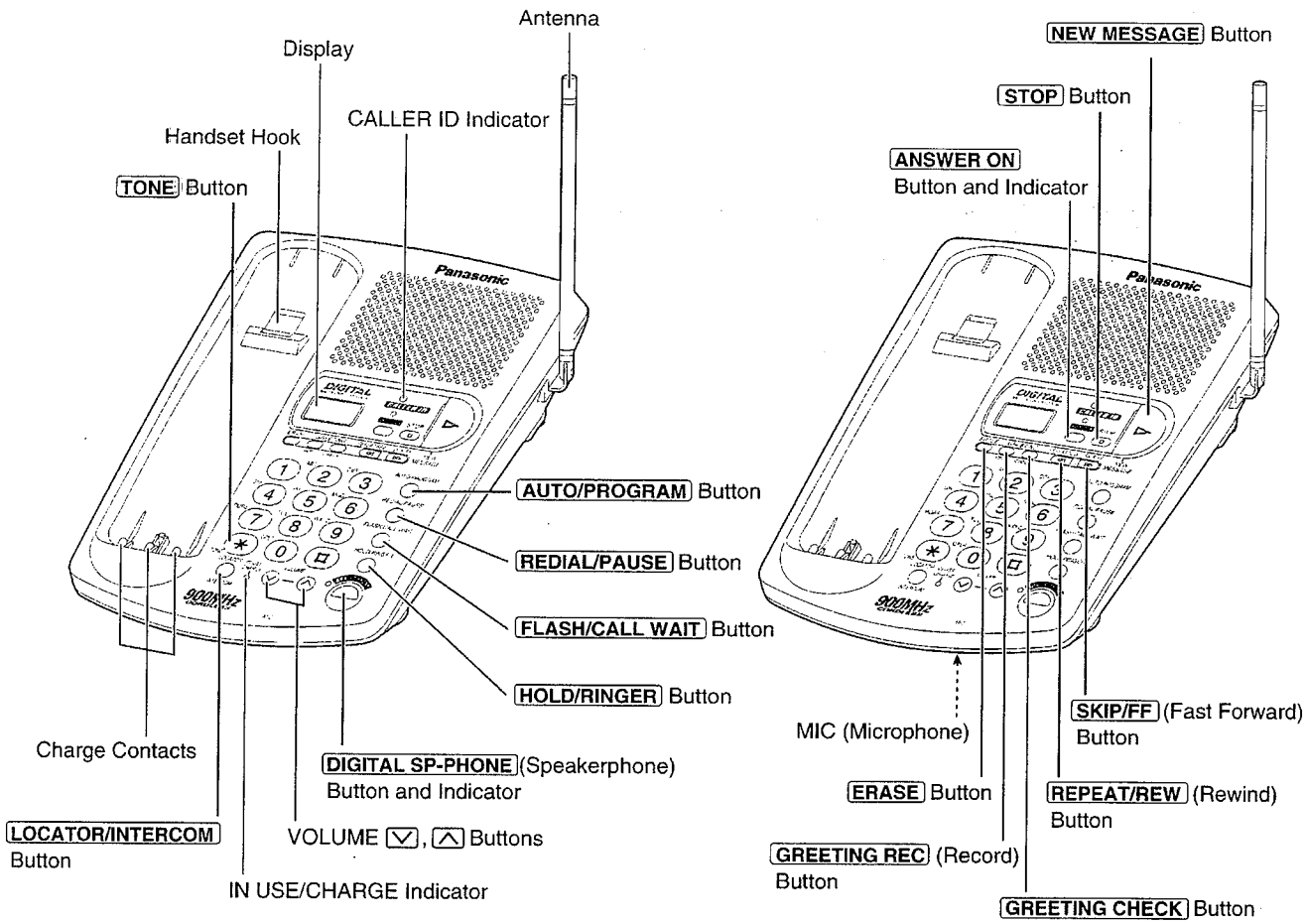
Recharge

Recharge the battery when:
– "Recharge" is displayed on the handset,
– "[▮]" flashes on the handset display, or
– the handset beeps intermittently while it is in use.

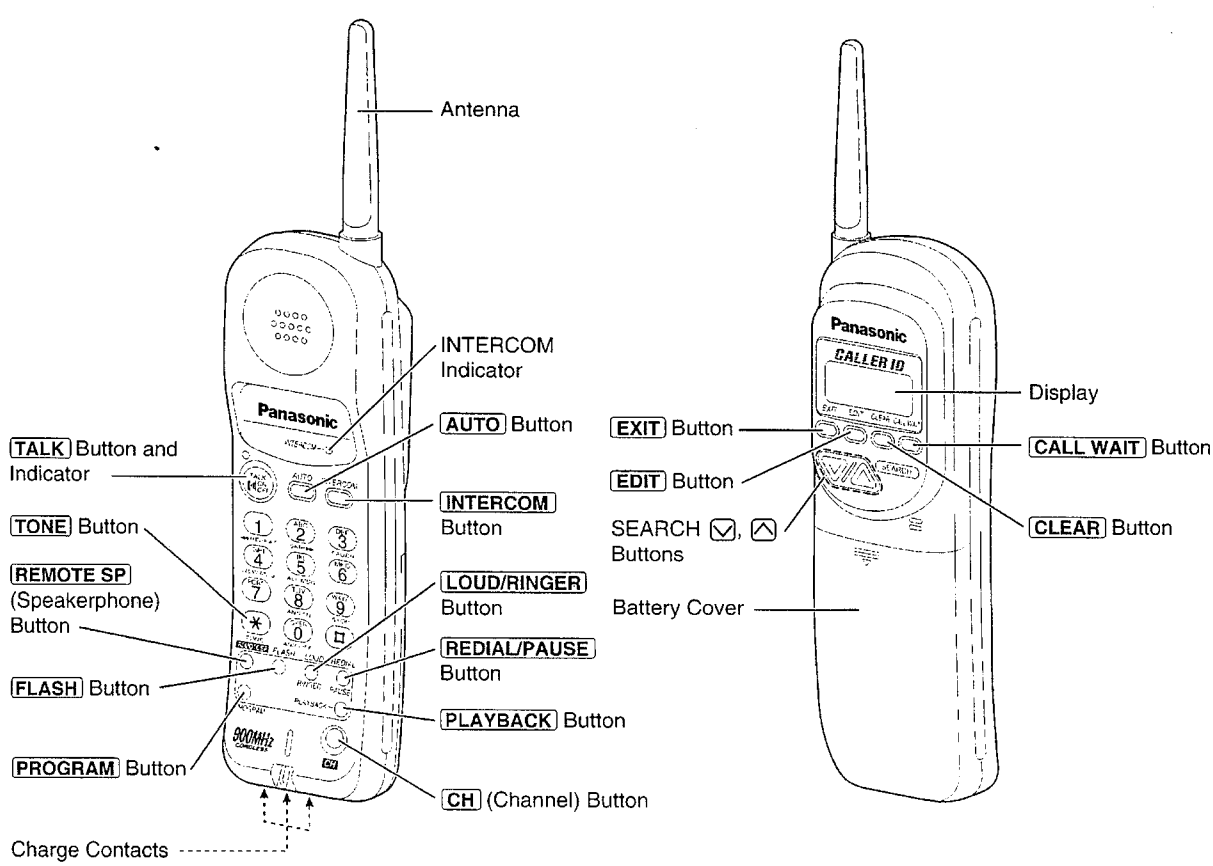


- If you DO NOT recharge the handset battery for more than 15 minutes, the display will keep indicating "Recharge" and/or "[▮]" will continue to flash.

2 LOCATION OF CONTROLS



(Base Unit)



(Handset)

2.1. Handset Display

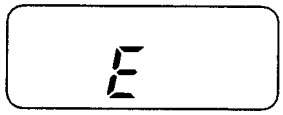
Both the he handset and the base unit show you information and instructions on their displays. These display prompts are shown below.

No items stored	The Caller List is empty.
Recharge [▮]	The battery needs to be charged. Place the handset on the base on the base unit to charge the battery.
12 new calls [▮▮▮]	The display shows the number of new calls and the present battery strength while the handset is on the base unit.
12 new calls ∨=New ∧=Old	This display will be shown when: – you lift the handset off the base unit, or – **SEARCH** ∨ or ∧ is pressed when the handset is off the base unit. To search from the most recent call, press **SEARCH** ∨ (New key). To search from the oldest call, press **SEARCH** ∧ (Old key).
Ringer off	When the handset ringer volume is set to OFF, "Ringer off" will flash for about 45 seconds before the handset returns to the stand-by mode.
Talk 01-06-35 [▮▮▮]	During a conversation, the display shows the length of the call (ex. 1 hour, 6 minutes and 35 seconds). The present battery strength is also displayed.
Out of range	The handset has lost communication with the base unit. Move closer to the base unit.
Save error	While programming, the handset lost communication with the base unit. Move closer to the base unit.
TINA ROBINSON 1-000-222-3333	When a call is received, the display shows the caller's name and number after the first ring.

JACK SMITH 111-2222 11:20A JAN12 ×3	This is a name from the Caller List. The display shows: — the caller's name, — the caller's number, — the time and date of the last call (ex. Jan. 12, 11:20 AM), and — the number of times called (ex. 3 times).
Paging Press INTERCOM	The base unit is paging the handset.
Intercom 00-00-07 [■■■]	The handset and the base unit are in the intercom mode.
Intercom hold 00-01-12 [■■■]	An outside call has been put on hold by the handset user in the intercom mode. To release the hold, press **TALK** or **DIGITAL SP-PHONE**.
NANCY BROWN 1-000-222-3333 ----Waiting----	A second call is received during a conversation.
Please lift up and try again	**SEARCH** ▽ or △ was pressed while the handset was on the base unit. Lift the handset and press **SEARCH** ▽ or △ again.
Not available	**SEARCH** ▽ or △ was pressed while the base unit was engaged in an outside call or the answering system was being operated at the base unit.
Answering system setting [■■■]	The unit is in answering system programming mode.
Remote operation [■■■]	The handset is operating the answering system remotely.

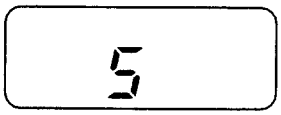
2.2. Base Unit Display

The clock needs adjusting.

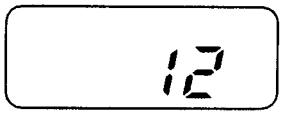


Your greeting message was not recorded correctly. Record it again.

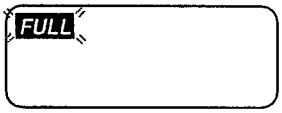
The unit is in the answering system programming mode.



The speaker volume level is set to "5".
You can select:
– 9 levels (0–8) while using the answering system.
– 8 levels (1–8) while using the speakerphone.



12 messages have been recorded.



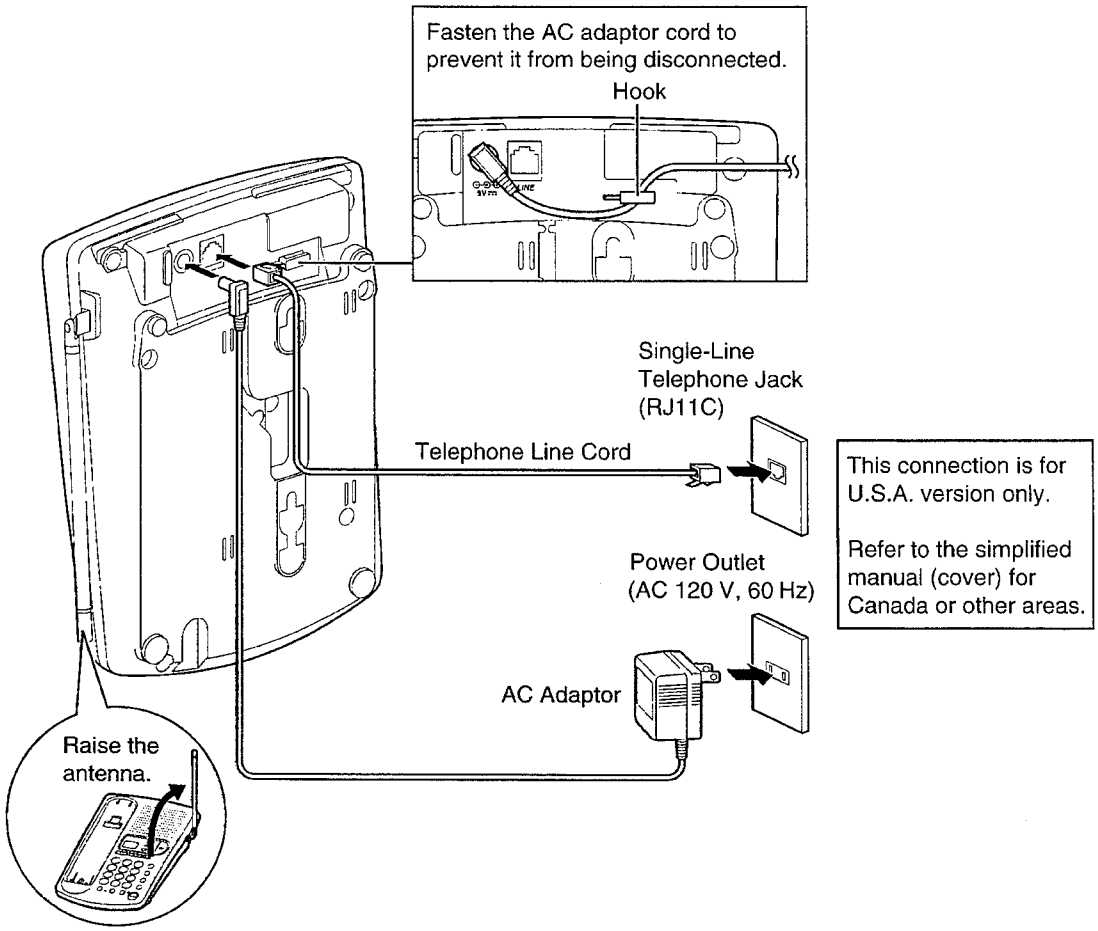
Memory is full. Erase some or all of the messages.

The recording time is set to "greeting only".
(The display is blank.)

The base unit ringer volume is set to OFF.

The pager call mode is set to ON.

3 CONNECTION TO A TELEPHONE LINE

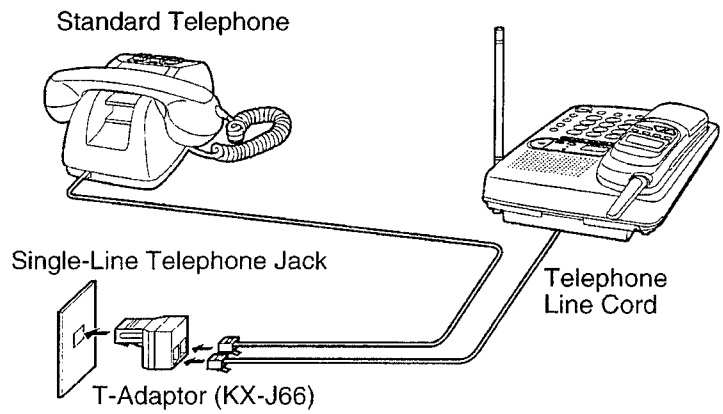

Fasten the AC adaptor cord to prevent it from being disconnected.
Hook
Single-Line Telephone Jack (RJ11C)
Telephone Line Cord
This connection is for U.S.A. version only.
Refer to the simplified manual (cover) for Canada or other areas.
Power Outlet (AC 120 V, 60 Hz)
AC Adaptor
Raise the antenna.

Note:

- USE ONLY WITH Panasonic AC ADAPTOR PQLV1Z.
- The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)
- If your unit is connected to a PBX which does not support Caller ID services, you cannot access those services.

3.1. Adding Another Phone

This unit will not function during a power failure. To connect a standard telephone on the same line, use the Panasonic T-adaptor KX-J66.



4 DISASSEMBLY INSTRUCTIONS

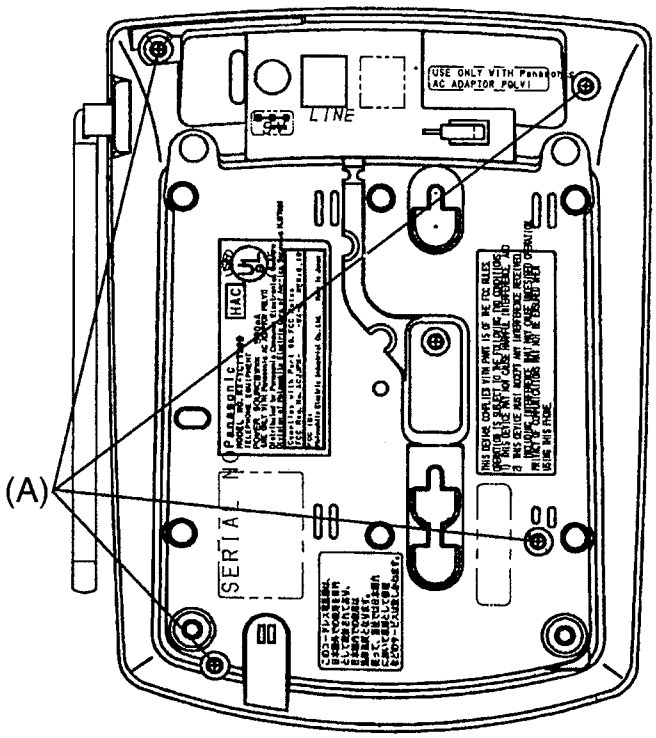


Fig. 1

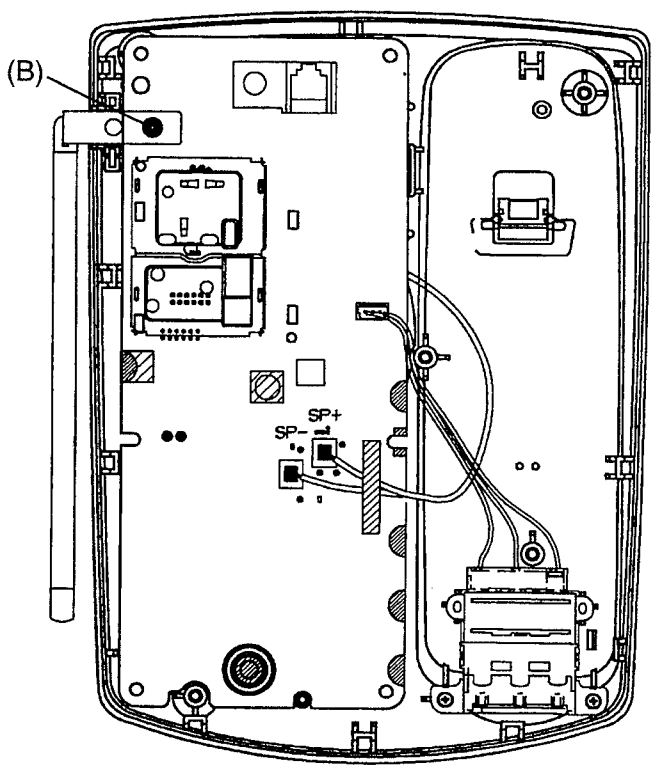


Fig. 2

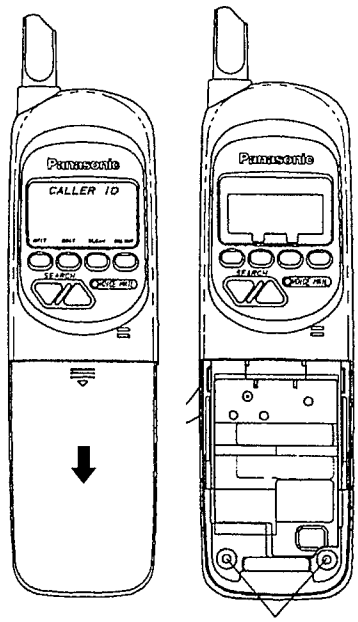
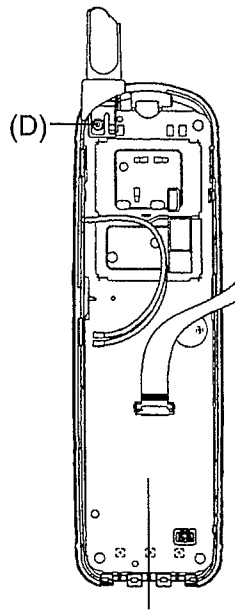


Fig. 3

(C)

Fig. 4



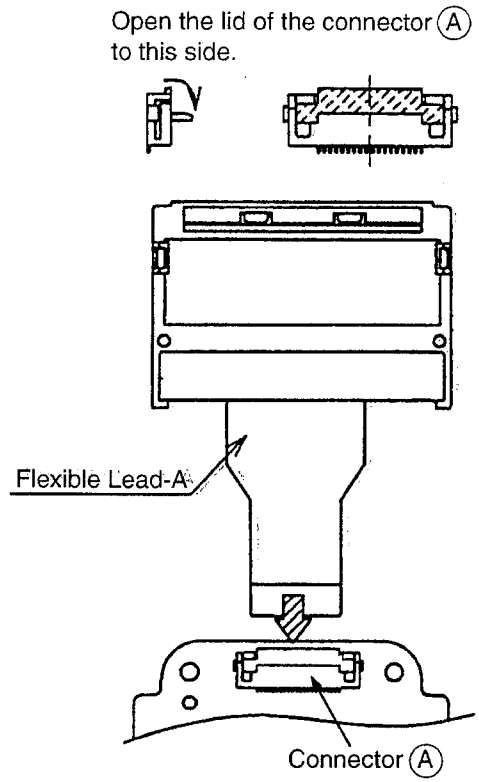
Remove the P.C.Board

Fig. 5

Ref No.	Procedure	Shown in Fig.-	To Remove	Remove
1	1	1	Lower Cabinet	Screws (3 X 14) (A) X 4
2	1, 2	2	P.C. Board	Screw (3 X 14) (B) X 1
3	3	3	Battery Cover	Remove the Battery Cover
4	3, 4	4	Rear Cabinet	Screws (2.6 X 14) (C) X 2
5	3~5	5	P.C. Board	Screw (2.6 X 14) (D) X 1

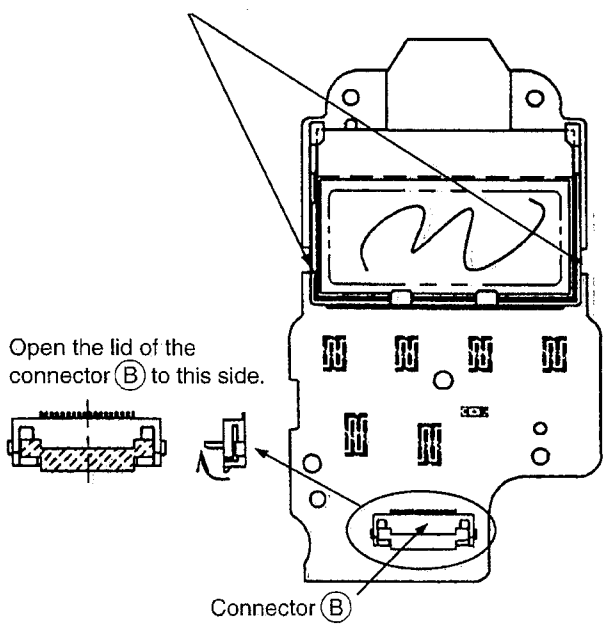
5 ASSEMBLY THE LCD TO P.C. BOARD

1. Flexible Lead-A is inserted in the connector Ⓐ .

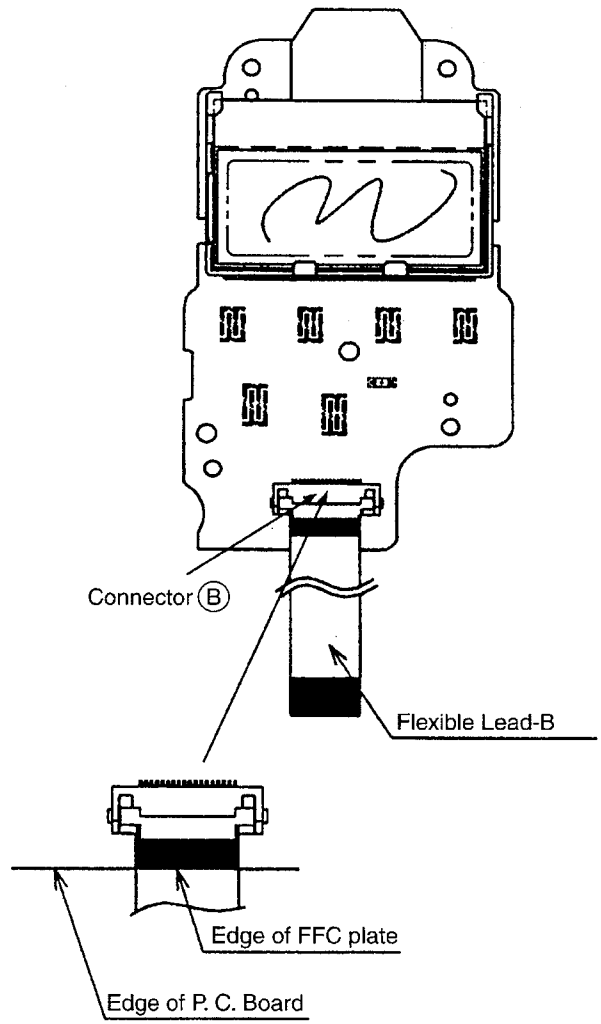


2. Close the lid of connector Ⓐ .

3. Hangs on the substraight with right and left catch.

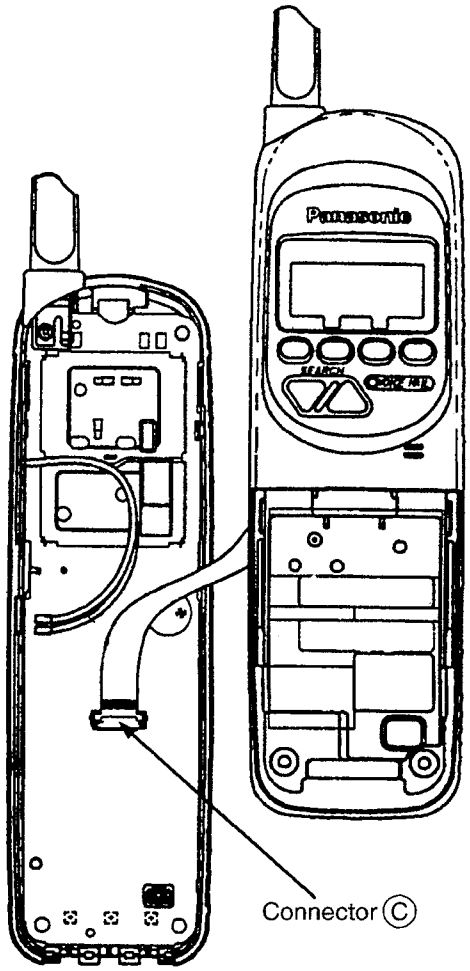


4. Flexible lead-B is inserted in the connector Ⓑ .

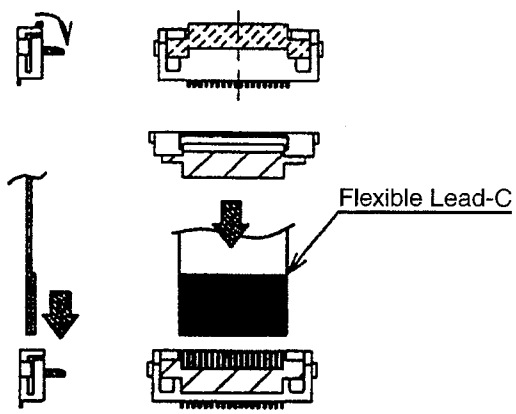


5. Close the lid of connector Ⓑ .

6. Flexible Lead-C wire is inserted in the connector Ⓒ.



Open the lid of the connector Ⓒ to this side.



7. Close the lid of connector Ⓒ.

6 ADJUSTMENT

6.1. Objective

This procedure will enable the technician to make adjustments to the KX-TC1740B HANDSET and BASE UNIT.

6.2. General Information

This procedure has 2 sections. The first section instructs the technician on how to align the HANDSET. We recommend aligning the HANDSET first, since you will need the HANDSET to align the BASE UNIT. The second section aligns the BASE UNIT. You can use either section separately, or together to align the entire cordless phone unit.

At the beginning of each section, you will find a preparation procedure instructing you on how to prepare the unit to the point of placing the unit in TEST mode. Please follow this procedure to insure proper alignment.

Each section ⊥s procedure consists of Adjustment Items adjusting one specific variable hardware component.
Each Item lists the equipment needed, how to connect and setup the equipment, how to make the adjustment, and how to verify the adjustment if necessary.

Before the actual procedure, you will find a procedure detailing how to place that part in TEST mode. You will have to perform this procedure before each individual Adjustment Item.

Once aligned, please remove all equipment connections and solder points, and reassemble the unit. As a final check, power up the phone and check for HANDSET linking with the BASE UNIT.

6.3. Equipment

1. Radio Tester : Marconi Model 2295A or later.
2. 4.5 digit Digital Multimeter : B&K Model 2833 or compatible.
3. Oscilloscope, single or dual channel : Panasonic VP-5512P100 or compatible.
4. Telephone Analyzer : B&K Model 1050 or compatible.
5. DC Power Supply, capable of supply 3.9V DC at 100mA NOTE : only needed if Telephone Analyzer does not have DC VOLTS output available.
6. Corded Telephone.
7. High Frequency Cable : BNC end to open end.
8. Audio Cable : BNC end to alligator clip end.
9. High Frequency Adjustment Tool:
10. Isolation Capacitors, quantity of 2, 10 µF maximum, 50V DC or greater.
11. Soldering Iron, solder, and various tools.

6.4. Handset Preparation

Please perform the following steps to prepare the HANDSET for alignment. Please refer to the HANDSET REFERENCE DRAWING for connection and test point locations.

1. Remove battery cover and battery.
2. Remove both screws at the case bottom.
3. Grabbing hold of the back near the bottom, gently pry off the back of the case.
4. Remove the antenna mounting screw. Pull out the antenna.
5. Unsolder both speaker connections on P.C.Board.
6. Remove the HANDSET P.C.Board.
7. Remove the keypad membrane.
8. Solder High Frequency Cable open end to ANT and RF GND points.
9. Using the Digital Multimeter, measure DC VOLTS output on the Telephone Analyzer. Adjust the output voltage to 3.9V DC.
10. Solder battery connection wires at the points shown in the HANDSET REFERENCE DRAWING. Solder the positive lead to TP-V_{DD}, towards the component side of the P.C.Board. Solder the negative lead to the TP-V_{SS}. **DO NOT APPLY POWER TO THE HANDSET AT THIS TIME!!!!!!**
11. Solder a small, insulated piece of wire to **GND** as well.
12. Solder 1 isolation capacitor⊥s positive lead to **SP+** test point. When soldering, keep the lead close to the P.C.Board as possible since you will lay the keypad membrane over part of this lead.
13. Solder a small, short, insulated wire to **MIC** test point.
14. Lay the keypad membrane over the keypad switch contacts.

6.5. Symptom/Remedy Table

If you have one of the listed symptoms, please refer to this table and make the appropriate adjustments.

SYMPTOM	REMEDY
Speaker level is unstable	Adjust Item (A).
Does not link with BASE UNIT	Adjust Items (B) and (C).
TX sound is unstable	Adjust Item (C) and (D).

6.6. Handset Adjustment Preparation

Please perform the following procedure before starting the Adjustment Procedure. You only have to perform this procedure only once to complete all Items, but you will have to perform this procedure to make an individual Adjustment Item.

1. You will need all equipment listed in the Item ⊥s EQUIPMENT section.
2. Setup all equipment as specified in the Item ⊥s PROCEDURE section SETUP portion.
3. Apply power to the HANDSET, and press TALK key.
4. Keep on pressing 5, 8 and 0 at the same time until a beep is heard from Handset.
5. Release the 3 keys. If you do not hear a beep, remove the power from the HANDSET and repeat the last 2 steps.
6. Press the **TALK** key. HANDSET should now be in TEST MODE (CH 1 TALK). The TALK should be on. If the HANDSET is not in TEST MODE, remove the power and repeat the last 3 steps.
7. Remove the keypad membrane and lay it aside to prevent pressing some button by mistake during alignment.

6.7. Adjustment Procedure

ADJUSTMENT ITEM DESCRIPTION	(A) SP Output
EQUIPMENT	**Marconi** SETUP Put in Receiver Test Mode. RF GEN FREQ 902.1000 MHz LEVEL 60 dBμV SET MOD FREQ 1.000 kHz LEVEL 6.000 kHz High Frequency Cable to RF Connector. Audio Cable positive lead to isolation capacitor, negative lead to **GND**, BNC end to AF INPUT connector.
PROCEDURE	Adjust **VR202** until **AF VOLTS** equals **-27 dBV +/- 1 dB (-25dBm +/- 1dB)** Note This voltage reading is with no speaker or load attached to the HANDSET P.C.Board.

ADJUSTMENT ITEM DESCRIPTION	(B) RX sensitivity and squelch confirmation
EQUIPMENT	**Marconi** SETUP Put in Receiver Test Mode. RF GEN FREQ 902.1000 MHz LEVEL 60 dBμV SET MOD FREQ 1.000 kHz LEVEL 6.000 kHz High Frequency cable to RF Connector. Audio Cable positive lead to isolation capacitor, negative lead to **GND**, BNC end to AF INPUT connector. **Oscilloscope** SETUP X1 probe connected to INPUT 1. Probe ground connected to **GND**. TIME/DIV 1ms VOLT/DIV 1V Auto trigger
PROCEDURE	On Marconi, press SINAD until the display shows the SINAD value and press **dB**. Then press RF **GEN** and **LEVEL**. Lower RF **GEN LEVEL** at SINAD 12 dB and confirm that RF GEN LEVEL is less than **+1 dBμV (+7 dBμVem*f*)**. When level is more than +1 dBμV (+7 dBμVem*f*), change RF unit. Attach the oscilloscope probe to SQL test point. When RF GEN LEVEL is set at +5 dBμV (+11 dBμVem*f*), confirm that the signal of SQL TEST POINT is Low. After that, set RF GEN LEVEL at -17 dBμV (-11 dBμVem*f*), and confirm that the signal of SQL TEST POINT is High. When level is NG, change RF unit.

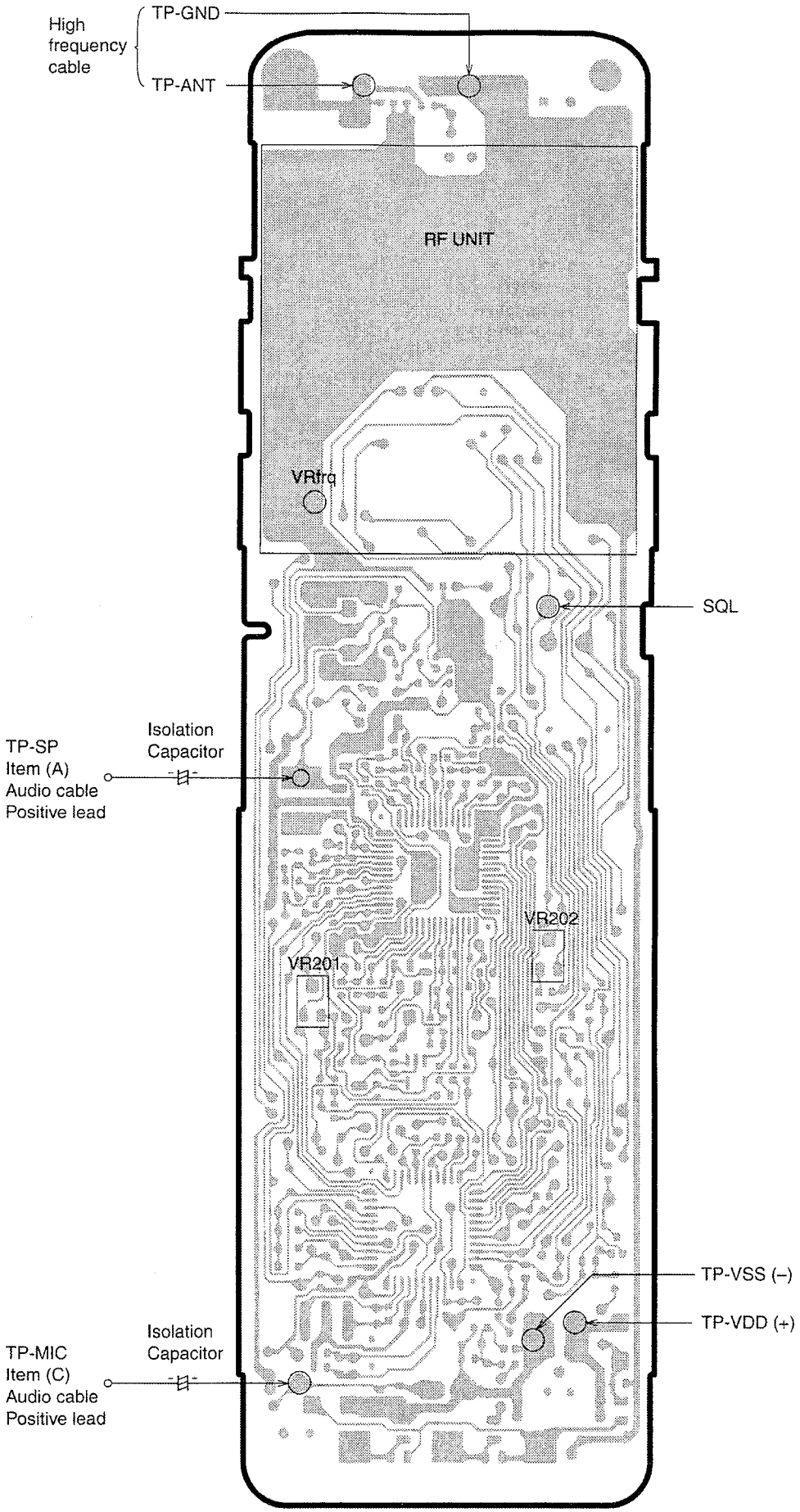
ADJUSTMENT ITEM DESCRIPTION	(C) MIC Input (MIC Modulation)
EQUIPMENT	**Marconi** SETUP Put in Transmitter Test mode. **AF GEN** **FREQ 1.000 KHz** **LEVEL -48 dBm (3mV) at 600 ΩLoad** Connect High Frequency Cable to RF connector. Connect Audio Cable positive lead to **MIC**, negative lead to **GND**, BNC end to AF GEN OUTPUT. Connect the isolation capacitor to positive lead side.
PROCEDURE	Adjust **VR201** until Marconi **MOD LEVEL** equals **6 kHz +/- 0.5 kHz.**

ADJUSTMENT ITEM DESCRIPTION	(D) Standard Frequency
EQUIPMENT	**Marconi** SETUP Put in Transmitter Test mode. **AF GEN** **FREQ 1.000 kHz** **LEVEL -48 dBm (3mV) at 600 ΩLoad** Connect High Frequency Cable to RF connector. Connect Audio Cable positive lead to **MIC**, negative lead to **GND**, BNC end to AF GEN OUTPUT.
PROCEDURE	Adjust **VRfrq** so that **926.100 MHz +/- 3kHz.** Note This Item's setup is exactly the same as Item (C). If you have done Item (C), simply look at TX FREQ and make the adjustment.

Once aligned, please perform the following procedure.

1. Disconnect all equipment and solder connections. Use solder wick to clean up any solder you added.
2. Install the keypad membrane on top of the HANDSET keys.
3. Install the HANDSET P.C.Board.
4. Solder speaker wires back onto the P.C.Board observing correct polarity.
5. If you will align Item (C) RX Input in BASE UNIT, then solder a short wire across the MIC leads. Remember to unsolder this wire after you completed the BASE UNIT alignment.
6. Insert antenna into the case.
7. Install antenna and top P.C.Board mounting screws.
8. Install case back and bottom mounting screws.
9. DO NOT INSTALL THE BATTERY AT THIS TIME!!!!!!

6.8. Handset Reference Drawing



6.9. Base Unit Preparation

Please prepare the BASE UNIT before performing any adjustment procedures. Refer to the BASE UNIT REFERENCE DRAWING for connection and test point locations.

1. Unscrew all 5 screws from bottom of cabinet. Remove cabinet bottom.
2. Remove the antenna screw.
3. Solder one isolation capacitor's positive lead to the main P.C.Board **TIP** point and the other isolation capacitor's positive lead to the main P.C.Board **RING** point.
4. Connect the Audio Cable, positive lead to the **TIP** isolation capacitor's free lead, the negative lead to the **RING** isolation capacitor's free lead. Do not connect the BNC end of the cable.
5. Connect the Telephone Analyzer **PHONE TEST JACK #1** to the BASE UNIT P.C.Board phone jack.
6. Connect the corded telephone to the Telephone Analyzer **PHONE TEST JACK #2.**
7. Remove main P.C.Board from cabinet top and place beside cabinet.
8. Solder High Frequency Cable open end to ANT and TP-GR as specified in BASE UNIT REFERENCE DRAWING.

6.10. Symptom/Remedy Table

If you have one of the listed symptoms, please refer to this table and make the appropriate adjustments.

SYMPTOM	REMEDY
Transmission sound to HANDSET receiver is unstable	Adjust items (A) and (C).
Does not link with HANDSET	Adjust items (C) and (D).

6.11. Base Unit Adjustment Preparation

Please perform the following steps to prepare the BASE UNIT for the Adjustment procedure.

1. Connect P.C.Board to all equipment as specified in **PROCEDURE** section, **SETUP** portion.
2. Connect AC Adaptor to AC Jack of BASE UNIT main P.C.Board.
3. Press **UP, DOWN** and **LOCATOR/INTERCOM** buttons simultaneously. BASE UNIT P.C.Board should be in TEST MODE (CH1 TALK). If unit is not in TEST MODE, remove power from P.C.Board and repeat last step.

ADJUSTMENT ITEM DESCRIPTION	(A) Standard Frequency
EQUIPMENT	**Marconi** SETUP Place in Transmitter Test mode. **AF GEN** **FREQ 1.000kHz** **LEVEL -25 dBm (44mV) at 600 Ω Load** High Frequency Cable to RF connector. **Telephone Analyzer** **Corded Phone** Take phone off hook
PROCEDURE	Adjust **VRfrq** so that **902.100 MHz +/- 3kHz.** Note This item's setup is exactly the same as Item (C). If you have done Item (C), simply look at TX FREQ on the Marconi and make the adjustment.

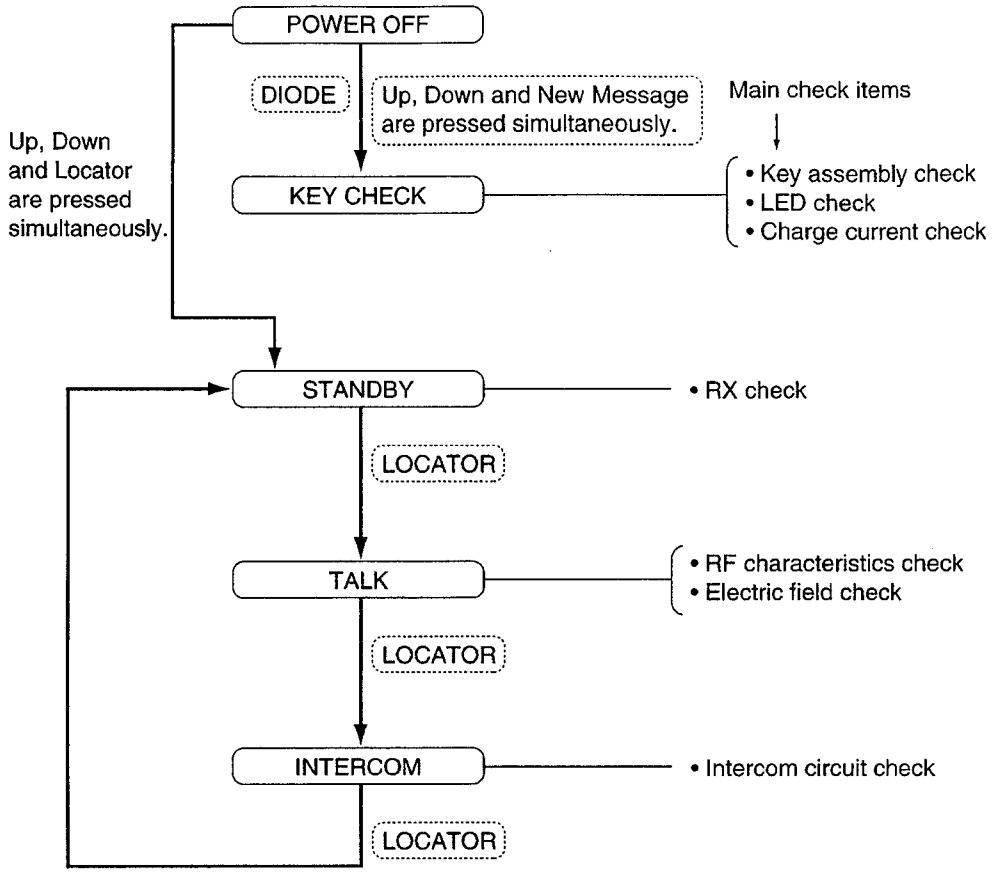
ADJUSTMENT ITEM DESCRIPTION	(B) TX Output
EQUIPMENT	**Marconi** SETUP Put in Receiver Test Mode. RF GEN FREQ 926.1000 MHz LEVEL 60 dBμ V SET MOD FREQ 1.000 kHz LEVEL 5.000 kHz High Frequency Cable to RF connector. Audio Cable positive lead to **TIP** isolation capacitor, negative lead to **RING** isolation capacitor, BNC end to AF INPUT connector. **Telephone Analyzer** **Corded Telephone** Take phone off hook
PROCEDURE	Adjust **VR402** until **AF VOLTS** equals **-17.5 dBV +/- 2 dB (-15.5 dBm +/- 2 dB)** Note You do not need to take the corded phone off hook, but you will hear the 1kHz tone. This will insure that your setup is probably working.

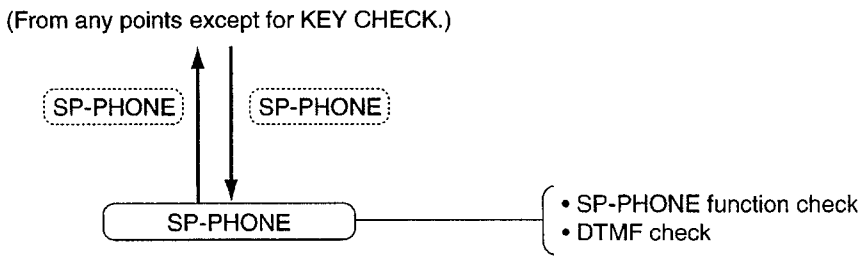
ADJUSTMENT ITEM DESCRIPTION	(C) Rx Input (Line Modulation)
EQUIPMENT	**Marconi** SETUP Place in Transmitter Test mode. **AF GEN** **FREQ 1.000kHz** **LEVEL -25 dBm (44 mV) at 600Ω Load.** High Frequency Cable to RF connector. **Telephone Analyzer** **Corded Phone** Take phone off hook **KX-TC1740B** **Handset** Placed in TEST mode by inserting battery while pressing 1, 9 and ✳ keys, then pressing TALK.
PROCEDURE	Adjust **VR401** until **MOD LEVEL** equals **7.3 kHz +/- 1.0 kHz** Notes You need to place the HANDSET in TEST mode to drown spurious RF signals being picked up at the BASE UNIT. By shorting the MIC leads insures that you are sending an unmodulated RF signal. You need the corded phone off hook to keep the telephone analyzer from sending a dial tone to the unit under test. The dial tone adds to the MOD LEVEL value greatly.

ADJUSTMENT ITEM DESCRIPTION	(D) RX sensitivity and squelch confirmation
EQUIPMENT	**Marconi** SETUP Put in Receiver Test Mode. RF GEN FREQ 926.1000 MHz LEVEL 60 dBμV SET MOD FREQ 1.000 kHz LEVEL 5.000 kHz High Frequency cable to left RF Connector. Audio Cable positive lead to **TIP** isolation capacitor, negative lead to **RING** isolation capacitor, BNC end to AF INPUT connector **Oscilloscope** SETUP X1 probe connected to INPUT 1. Probe ground connected to **GND**. TIME/DIV 1ms VOLT/DIV 1V Auto trigger **Telephone Analyzer** **Corded Phone** Take off hook
PROCEDURE	On Marconi, press SINAD until the display shows the SINAD value and press **dB**. Then press RF **GEN** and **LEVEL**. Lower RF **GEN LEVEL** at SINAD 12 dB and confirm that RF GEN LEVEL is less than **+4 dBμV (+10 dBμVem*f*)**. When level is more than +4 dBμV (+10 dBμVem*f*), change RF unit. Attach the oscilloscope probe to SQ POINT. When RF GEN LEVEL is set at +5 dBμV (+11 dBμVem*f*),comfirm that SQ POINT is Low. After that, set RF GEN LEVEL at -17 dBμV (-11 dBμVem*f*), and confirm that the SQ POINT is High. When level is NG, change RF unit.

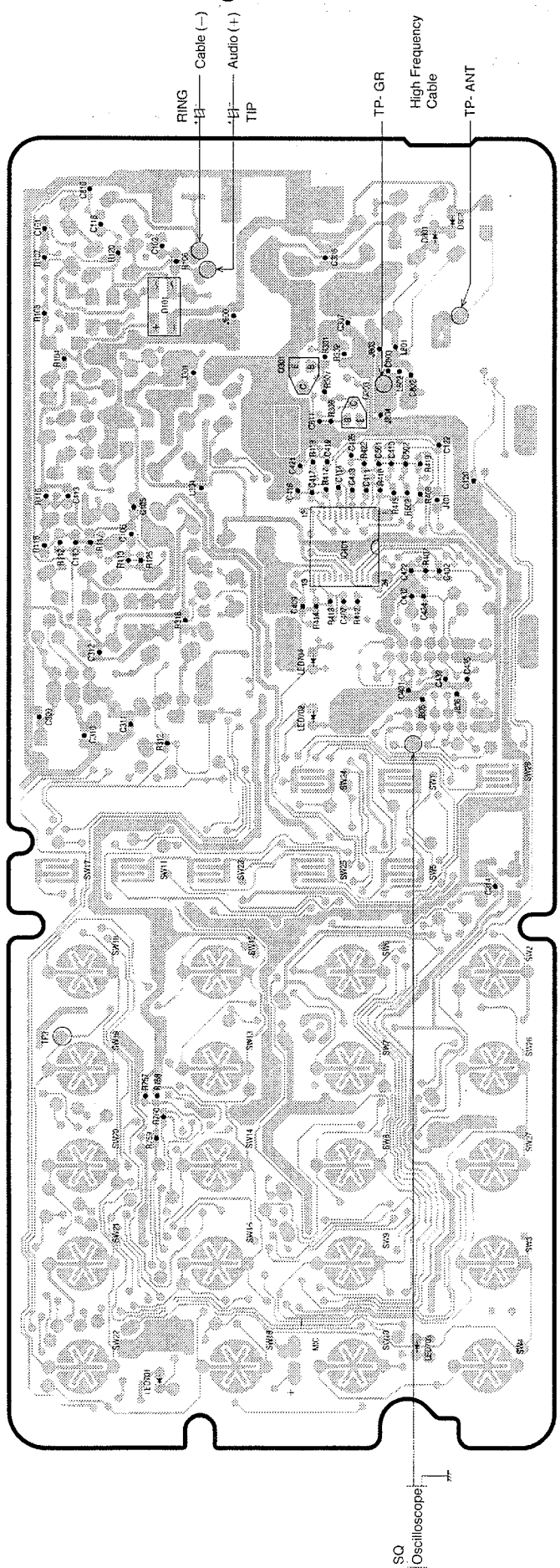
Once aligned, please reassemble the base unit. Also take off the back of the HANDSET and unsolder the MIC lead short wire if you previously installed it.

Test mode flow chart for maintenance of the base unit





6.12. Base Unit Reference Drawing



7 HOW TO CHECK THE RF UNIT

Factory supply only assembled RF unit for base unit and Handset of KX-TC1740B. (Factory does not supply each parts on RF Unit.)

7.1. Handset

1. Warm up the Marconi Radio Tester for at least 30 minutes to allow internal crystal oscillation to become stable.
2. Refer to figures right for Handset wire connections.
3. Disconnect the Handset antenna from the PCB. If you allow the antenna to remain and be a load, the readings will be wrong.
4. Supply DC 3.9V Handset PCB using a DC power supply.
5. Solder RF cable to TP-ANT and TP-GND and connect BNC side to Marconi. Use 100 W max. RF Input.
6. Press **TALK**, then press "**5**", "**8**" and "**0**" simultaneously.
7. Press **TALK**. (Base Unit power is off)

7.1.1. Carrier frequency check:

1. Set Marconi to Transmit Test (press **TX TEST** button).
2. Check TX Frequency =**926.100 MHz+/-3.0 kHz**.
3. When value if off, adjust **VRfreq**.
4. If can't adjust replace RF Unit.

7.1.2. Transmit power check:

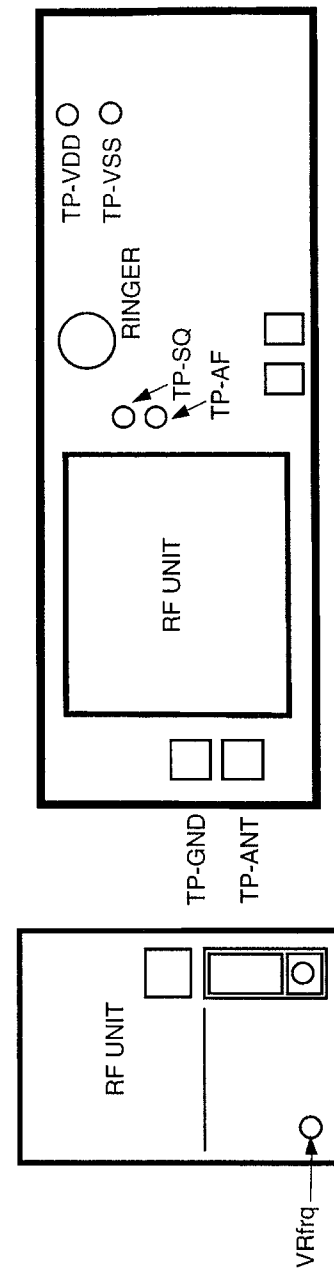
1. Press **dBm** button on Marconi.
2. Check Marconi TX Power reading. It should equal **-3.5 dBm+/-4 dBm** (-7.5 dBm ~ +1.5 dBm).
3. When value is over, replace RF Unit.

7.1.3. Receiving sensitivity check:

1. Connect audio cable BNC side to AF INPUT in Marconi and other side to TP-AF and TP-GND.
2. Set Marconi to **RX TEST** mode. Enter the following setting:
   a. Frequency = **902.100 MHz**
   b. Level = **60 dBµV**
   c. Set Modulation = **1.000 kHz**
   d. Level = **6.000 kHz**
3. Press the **SINAD** button on Marconi until the display shows SINAD value. Press the **dB** button.
4. Press the **RF GEN** and **LEVEL** button.
5. Using the **VARIABLE** knob on Marconi decrease RF GEN LEVEL value until **SINAD** value is **12 dB**.
6. Check the **RF GEN LEVEL**. This should be **less than +1 dBµV**(+7 dBµVemf). When value is over, replace RF Unit.

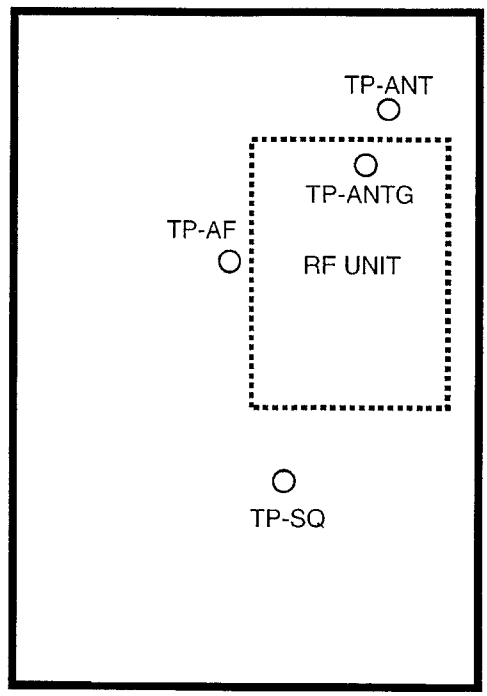
7.1.4. Squelch check:

1. Connect scope probe (X1) lead to TP-SQ, negative to TP-VSS and BNC end to scope.
2. Set scope to the following codition: TIME/DIV = 1 msec, VOLT/DIV = 1 V
3. Set **RF GEN LEVEL** to **+5 dBµV**(+11dBµVemf). Check scope voltage is **LOW**.
4. Set **RF GEN LEVEL** to **-17 dBµV**(-11dBµVemf). Check scope voltage is **HIGH**.
5. When scope voltage is wrong, replace RF Unit.



7.2. Base Unit

1. Please refer to figures right for base unit wire connection.
2. Solder wire connections D902. (Refer to **6.12. Base Unit Reference Drawing**.)
3. Connect the AC Adaptor (PQLV1Z) to base unit.
4. Press HANDSET LOCATOR twice to set base to test mode.



(Solder Side)

7.2.1. Carrier frequency check:

1. Solder RF cable to TP-ANT and TP-ANTG.
2. Set Marconi to Transmit Test mode by pressing **TX TEST**.
3. Check TX Frequency as shown on CRT. This should be **902.100 MHz+/-3 kHz**.
4. Adjust value when this is above **902.100 MHz+/-3 kHz**. If can't adjust replace RF Unit.

7.2.2. Transmit power check:

Check **TX POWER** reading equals to **-10 dBm+/-4 dBm** (reading should -14 dBm to -6 dBm).

If reading is given in µW, press **dB** button.

7.2.3. Receiving sensitivity check:

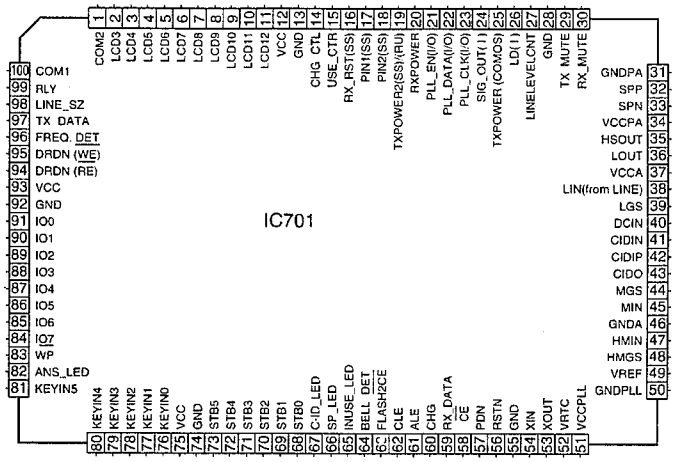
1. Connect audio cable positive lead to TP-AF, negative lead to TP-ANTG and BNC end to AF INPUT.
2. Set Marconi to Receiver Test mode by pressing **RX TEST**. Enter the following value:
   a. RF Frequency = **926.100 MHz**
   b. LEVEL = **60 dBµV**
   c. Modulation Frequency = **1.000 kHz**
   d. LEVEL = **5.000 kHz**
3. Press **SINAD** button until the display shows the SINAD value and press **dB** button.
4. Press **RF GEN** and **LEVEL** buttons. Using the **VARIABLE** knob. Decrease RF GEN LEVEL until **SINAD** value is **12 dB**.
5. Check the **RF GEN LEVEL** equals **less than +2 dBµV**(+8 dBµVemf). When value is over, change RF Unit.

7.2.4. Squelch check:

1. Keep same RX TEST settings as in **Receiving Sensitivity Check**.
2. Connect scope (X1) positive lead to TP-SQ, negative lead to TP-ANTG and BNC end to scope. Set scope to following condition.
   a. TIME/DIV =**1 msec**.
   b. VOLT/DIV = **1 V**
3. Set **RF GEN LEVEL** to **+5 dBµV** (+11 dBµVemf). Check scope voltage is **LOW**.
4. Set **RF GEN LEVEL** to **-17 dBµV** (-11 dBµVemf). Check the scope voltage is **HIGH**.
5. When value is over, replace RF Unit.

8 CPU DATA (Base Unit)

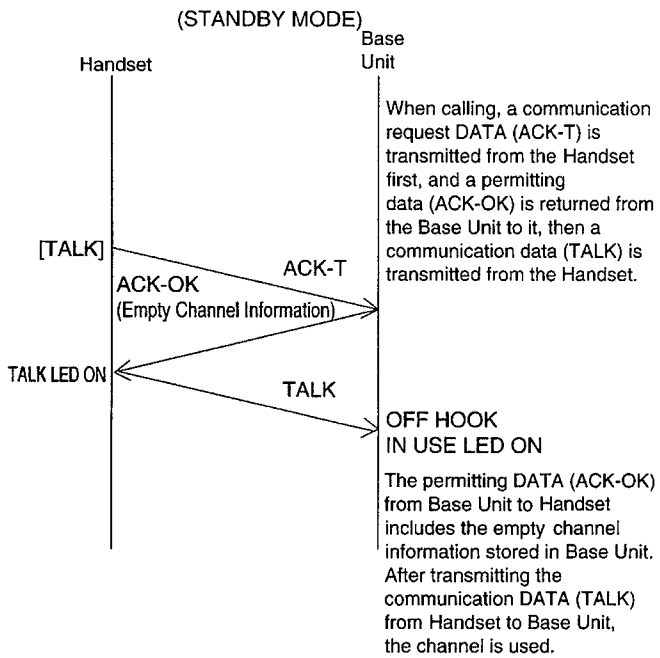
8.1. IC701



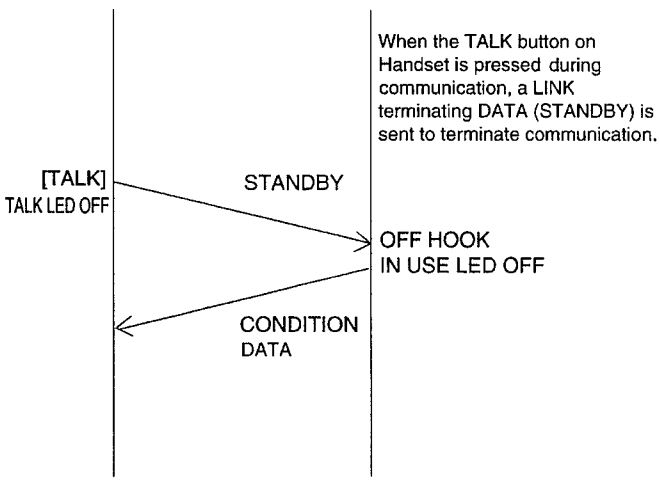
Pin	Description	I/O	High	High-Z	Low
1	COM2	O	Active	1/2Vcc	Active
2	LCD3	O	-	-	-
3	LCD4	O	-	-	-
4	LCD5	O	-	-	-
5	LCD6	O	-	-	-
6	LCD7	O	-	-	-
7	LCD8	O	-	-	-
8	LCD9	O	-	-	-
9	LCD10	O	-	-	-
10	LCD11	O	-	-	-
11	LCD12	O	-	-	-
12	VCC	-	-	-	-
13	GND	-	-	-	-
14	CHG_CTL	O	Ultra	-	Trickle
15	USE_CTL	O	Rly off	-	Rly on
16	RX-RST(SS)	-	-	-	Not used
17	PIN1(SS)	-	-	-	Not used
18	PIN2(SS)	-	-	-	Not used
19	TXPOWER2(SS)/(RU)	-	-	-	Not used
20	RXPOWER	O	OFF	-	ON
21	PLL_EN(I/O)	O	Latch	-	-
22	PLL_DATA(I/O)	O	Active	-	Normal
23	PLL_CLK(I/O)	O	Active	-	Normal
24	SIG_OUT(I)	I	Weak Electric Field	-	Strong Electric Field
25	TXPOWER(COMOS)	O	OFF	-	ON
26	LD(I)	I	Lock	-	Unlock
27	LINELEVELCNT	O	-	-	TAM
28	GND	-	-	-	-
29	TX_MUTE	O	Mute	-	Unmute
30	RX-MUTE	O	Mute	-	Unmute
31	GNDPA	-	-	-	-
32	SPP	-	-	-	-
33	SPN	-	-	-	-
34	VCCPA	-	-	-	-
35	HSOUT	-	-	-	-
36	LOUT	-	-	-	-
37	VCCA	-	-	-	-
38	LIN(from LINE)	-	-	-	-
39	LGS	-	-	-	-
40	DCIN	-	-	-	-
41	CIDIN	-	-	-	-
42	CIDIP	-	-	-	-
43	CIDO	-	-	-	-
44	MGS	-	-	-	-
45	MIN	-	-	-	-
46	GNDA	-	-	-	-
47	HMIN	-	-	-	-
48	HMGS	-	-	-	-
49	VREF	-	-	-	-
50	GNDPLL	-	-	-	-
51	VCCPLL	-	-	-	-
52	VRTC	-	-	-	-
53	XOUT	-	-	-	-
54	XIN	-	-	-	-
55	GND	-	-	-	-
56	RSTN	-	Reset	-	-
57	PDN	-	-	-	Powerdown
58	$\overline{CE}$	-	-	-	-
59	RX_DATA	I	Normal	-	Active
60	CHG	I	OFF Chg	-	ON Chg
61	ALE	-	-	-	-
62	CLE	-	-	-	-
63	FLASH2CE	-	Not used	-	Not used
64	BELL_DET	I	Bell	-	-
65	INUSE_LED	O	OFF	-	ON
66	SP_LED	O	OFF	-	ON
67	C-ID_LED	O	OFF	-	ON
68	STB0	O	Strobe	-	-
69	STB1	O	Strobe	-	-
70	STB2	O	Strobe	-	-
71	STB3	O	Strobe	-	-
72	STB4	O	Strobe	-	-
73	STB5	O	Strobe	-	-
74	GND	-	-	-	-
75	VCC	-	-	-	-
76	KEYIN0	I	Key in	-	-
77	KEYIN1	I	Key in	-	-
78	KEYIN2	I	Key in	-	-
79	KEYIN3	I	Key in	-	-
80	KEYIN4	I	Key in	-	-
81	KEYIN5	I	Key in	-	-
82	ANS_LED	O	ON	-	OFF
83	WP	I/O	Enable	-	-
84	IO7	I/O	-	-	-
85	IO6	I/O	-	-	-
86	IO5	I/O	-	-	-
87	IO4	I/O	-	-	-
88	IO3	I/O	-	-	-
89	IO2	I/O	-	-	-
90	IO1	I/O	-	-	-
91	IO0	I/O	-	-	-
92	GND	-	-	-	-
93	VCC	-	-	-	-
94	DRDN(RE)	-	-	-	-
95	DWRN(WE)	-	-	-	-
96	FREQ. DET	I	-	-	-
97	TX_DATA	O	Active	-	Normal
98	LINE_SZ	O	ON	-	OFF
99	RLY	O	ON	-	OFF
100	COM1	O	-	-	-

10 EXPLANATION OF CPU DATA COMMUNICATION

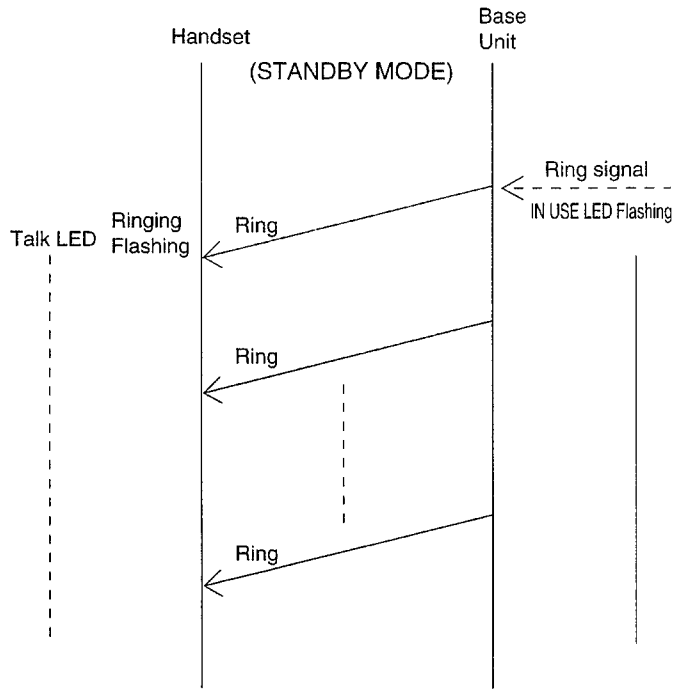
10.1. Calling


(STANDBY MODE)
Handset
Base Unit
When calling, a communication request DATA (ACK-T) is transmitted from the Handset first, and a permitting data (ACK-OK) is returned from the Base Unit to it, then a communication data (TALK) is transmitted from the Handset.
[TALK]
ACK-T
ACK-OK
(Empty Channel Information)
TALK LED ON
TALK
OFF HOOK
IN USE LED ON
The permitting DATA (ACK-OK) from Base Unit to Handset includes the empty channel information stored in Base Unit. After transmitting the communication DATA (TALK) from Handset to Base Unit, the channel is used.

10.2. To Terminate Communication


When the TALK button on Handset is pressed during communication, a LINK terminating DATA (STANDBY) is sent to terminate communication.
[TALK]
TALK LED OFF
STANDBY
OFF HOOK
IN USE LED OFF
CONDITION
DATA

10.3. Ringing



After detecting the Ring signal from circuit, Base Unit sends a ring signal DATA (Ring), then the Handset starts ringing.

10.4. Ports for Transmitting and Receiving of Data

Handset:

transmitting ... 26 Pin receiving ... 27 Pin

Base Unit:

transmitting ... 97 Pin receiving ... 59 Pin

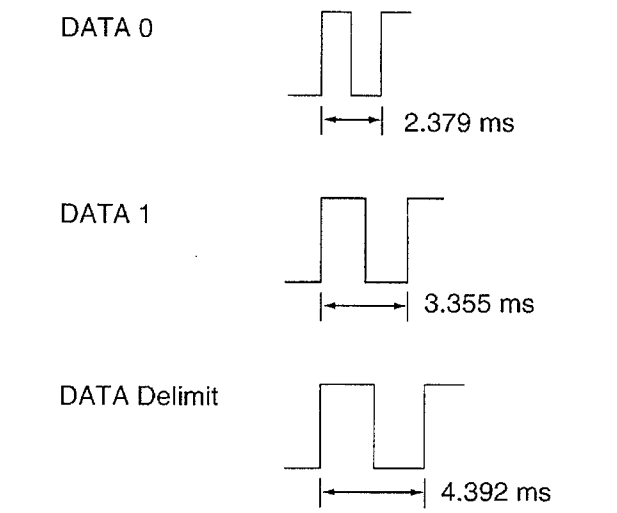
10.5. Waveform of DATA Used for Cordless Transmission and Reception

The DATA which is transmitted from the Handset to the Base Unit is combination of DATA 0, DATA 1, DATA Delimt, Pre data and End data.

The DATA which is transmitted from the Base Unit to the Handset is combination of DATA 0, DATA 1, DATA Delimt, Pre data and End data.

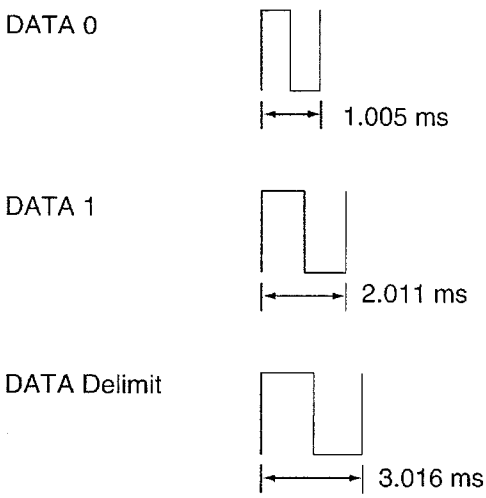
10.5.1. Handset

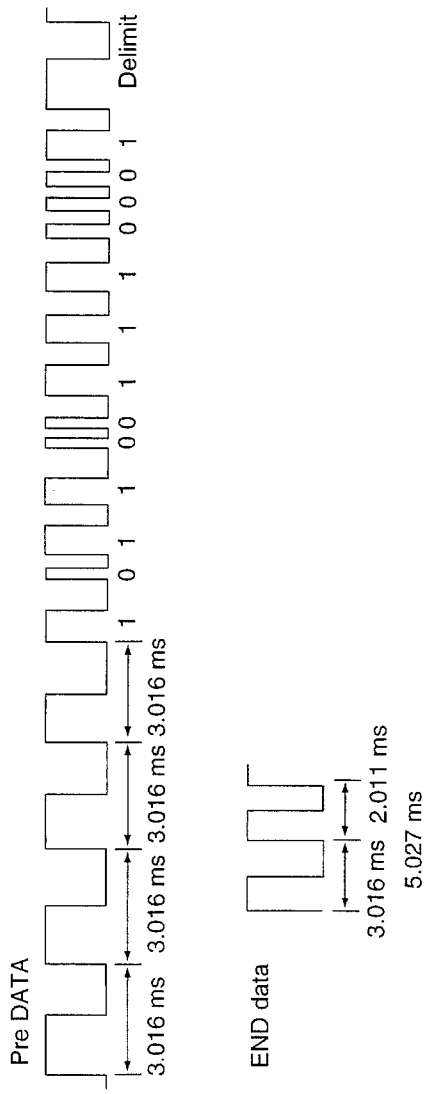
Transmitting DATA Format



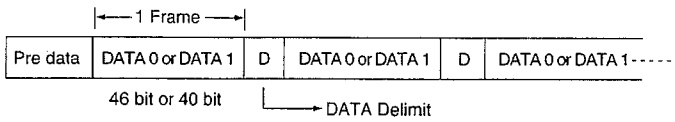
10.5.2. Base Unit

Transmitting DATA Format



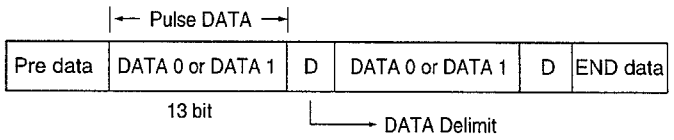


10.6. When LINKing



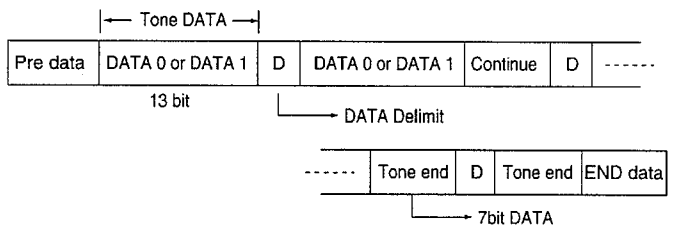
When LINKing from the Handset (when becoming STBY to TALK), DATA is transmitted in above format. The combined portion of DATA 0 and DATA 1 is transmitted in LINK requesting DATA (40bit) format first. Then, when LINK OK (ACK-OK) DATA (46bit) is returned from the Base Unit, it is sent as LINK from DATA after changing the combination of DATA 0 and DATA 1. And the DATA Delimit is between each Frame as a stop.
The contents of LINK requesting DATA and LINK form DATA are different depending on each operation.

10.7. Pulse Dial



When executing Pulse Dial, the Pulse Dial DATA is transmitted from the Handset to the Base Unit in above format. The combination of DATA 0 and DATA 1 are changed by each Dial No. And the DATA Delimt is between each Frame as a stop. The number of Frame is 2.

10.8. Tone Dial



When executing Tone Dial, Tone Dial DATA is transmitted from the Handset to the Base Unit in above format. The DATA is changed by Dial No. as same as Pulse Dial. When Tone Dialing, DATA (Continue DATA) that the key is pressed continuously is sent to the Base Unit during the key is pressed. When depressing the key, the TONE Dial exterminating DATA (Tone end DATA) is send, and the END data is sent finally.

Note:

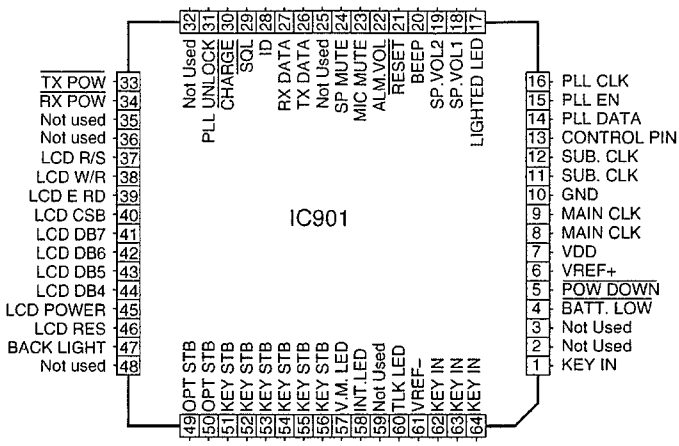
1,000,000 kinds of the security code are available for the mode KX-TC1740B. Each time the Handset is set on the cradle of the base unit (for charging), the CPU automatically change the security code.

11 FREQUENCY TABLE (MHz)

CH	Base Unit TX Handset RX	Base Unit RX Handset TX
1	902.100 MHz	926.100 MHz
2	902.150 MHz	926.150 MHz
3	902.200 MHz	926.200 MHz
4	902.250 MHz	926.250 MHz
5	902.300 MHz	926.300 MHz
6	902.350 MHz	926.350 MHz
7	902.400 MHz	926.400 MHz
8	902.450 MHz	926.450 MHz
9	902.500 MHz	926.500 MHz
10	902.550 MHz	926.550 MHz
11	902.600 MHz	926.600 MHz
12	902.650 MHz	926.650 MHz
13	902.700 MHz	926.700 MHz
14	902.750 MHz	926.750 MHz
15	902.800 MHz	926.800 MHz
16	902.850 MHz	926.850 MHz
17	902.900 MHz	926.900 MHz
18	902.950 MHz	926.950 MHz
19	903.000 MHz	927.000 MHz
20	903.050 MHz	927.050 MHz
21	903.100 MHz	927.100 MHz
22	903.150 MHz	927.150 MHz
23	903.200 MHz	927.200 MHz
24	903.250 MHz	927.250 MHz
25	903.300 MHz	927.300 MHz
26	903.350 MHz	927.350 MHz
27	903.400 MHz	927.400 MHz
28	903.450 MHz	927.450 MHz
29	903.500 MHz	927.500 MHz
30	903.550 MHz	927.550 MHz

9 CPU DATA (Handset)

9.1. IC901



Pin	Description	I/O	High	High-Z	Low
1	KEY IN	I	OFF	-	ON
2	Not Used	I	-	-	-
3	Not Used	I	-	-	-
4	BATT.LOW	O		-	BATT.LOW
5	POW DOWN	O		-	POW DOWN
6	VREF+	-	-	-	-
7	VDD	-	-	-	-
8	MAIN CLK	O	Oscillation	-	Oscillation
9	MAIN CLK	I	Oscillation	-	Oscillation
10	GND	-	-	-	-
11	SUB. CLK	I	Oscillation	-	Oscillation
12	SUB. CLK	O	Oscillation	-	Oscillation
13	CONTROL PIN	I	-	-	Fixed
14	PLL DATA	O		-	
15	PLL EN	O		-	LACH
16	PLL CLK	O		-	
17	LIGHTED LED	O	ON	-	OFF
18	SP.VOL1	O	High	-	Low
19	SP.VOL2	O	High	-	Low
20	BEEP	O		-	
21	RESET	I	Release	-	RES
22	ALM.VOL	O	Low	-	High
23	MIC MUTE	O	ON	-	OFF
24	SP MUTE	O	ON	-	OFF
25	Not Used	O		-	Fixed
26	TX DATA	O		-	
27	RX DATA	I		-	
28	ID	I		-	-
29	SQL	I	Electric Field ON	-	Electric Field OFF
30	CHARGE	I		-	Charge
31	PLL UNLOCK	I	LOCK	-	UNLOCK
32	Not Used	O	-	-	Fixed

Pin	Description	I/O	High	High-Z	Low
33	TX POW	O	-	OFF	ON
34	RX POW	O	-	OFF	ON
35	Not Used	O	-	-	Fixed
36	Not Used	O	-	-	Fixed
37	LCD R/S	O	DATA	-	INSTRUCTION
38	LCD W/R	O	READ	-	WRITE
39	LCD E RD	O	CLOCK	-	CLOCK
40	LCD CSB	O		-	SELECT
41	LCD DB7	O		-	
42	LCD DB6	O		-	
43	LCD DB5	O		-	
44	LCD DB4	O		-	
45	LCD POWER	O	POW OFF	-	POW ON
46	LCD RES	O	-	-	RESET
47	BACK LIGHT	O	ON	-	OFF
48	Not Used	O	-	-	Fixed
49	OPT STB	O	-	OFF	STB ON
50	OPT STB	O	-	OFF	STB ON
51	KEY STB	O	-	OFF	STB ON
52	KEY STB	O	-	OFF	STB ON
53	KEY STB	O	-	OFF	STB ON
54	KEY STB	O	-	OFF	STB ON
55	KEY STB	O	-	OFF	STB ON
56	KEY STB	O	-	OFF	STB ON
57	V.M. LED	O	-	OFF	ON
58	INT. LED	O	-	OFF	ON
59	Not Used	O	-	OFF	ON
60	TLK LED	O	-	OFF	ON
61	VREF-	O	-	-	-
62	KEY IN	I	OFF	-	ON
63	KEY IN	I	OFF	-	ON
64	KEY IN	I	OFF	-	ON

12 HOW TO REPLACE FLAT PACKAGE IC

12.1. Preparation

- SOLDER

  Sparkle Solder 115A-1, 115B-1 or Almit Solder KR-19, KR-19RMA

- Soldering iron

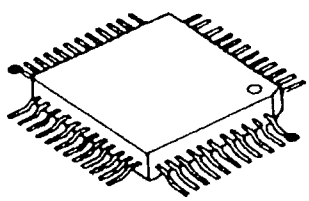
  Recommended power consumption will be between 30 W to 40 W.
  Temperature of Copper Rod 662 ± 50°F (350 ± 10°C)
  (An expert may handle between 60 W to 80 W iron, but beginner might damage foil by overheating.)

- Flux

  HI115 Specific gravity 0.863
  (Original flux will be replaced daily.)

12.2. Procedure

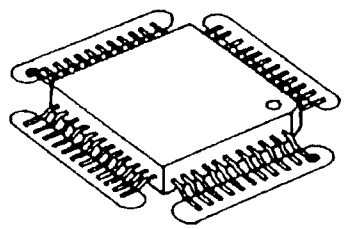
1. Temporary fix FLAT PACKAGE IC by soldering on two marked 2 pins.



●- - - - - -Temporary soldering point.

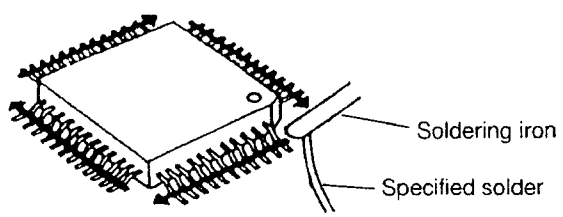
*Most important matter is accurate setting of IC to the corresponding soldering foil.

2. Apply flux for all pins of FLAT PACKAGE IC.



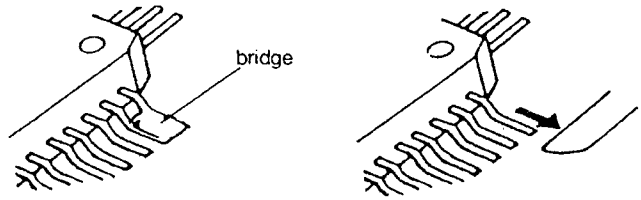
- - - - - Flux

3. Solder employing specified solder to direction of arrow, as sliding the soldering iron.



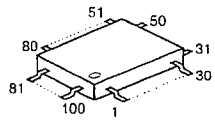
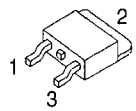
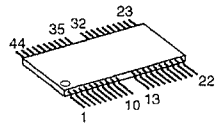
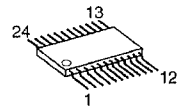
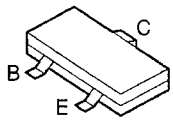
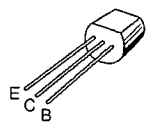
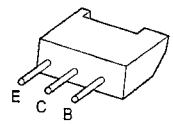
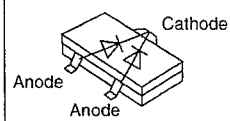
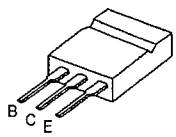
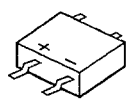
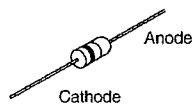
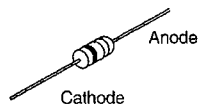
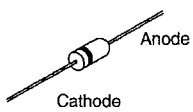
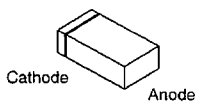
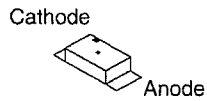
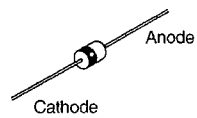
12.3. Modification Procedure of Bridge

1. Re-solder slightly on bridged portion.
2. Remove remained solder along pins employing soldering iron as shown in below figure.

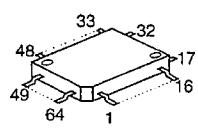
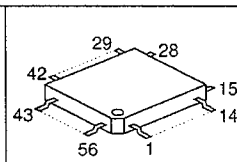
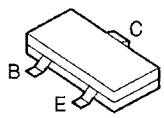
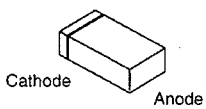
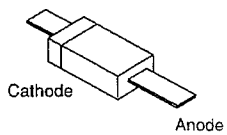
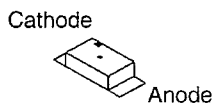


13 TERMINAL GUIDE OF IC´S, TRANSISTORS AND DIODES

13.1. Base Unit

 PQVI16559AAD	 PQVIL7806D2T	 PQWITC1740BH	 AN6137SB
 2SD1819A, UN5113 UN5213, 2SD601R	 2SA1625, PQVT2N6517CA 2SC2120	 2SD1994A 2SD1991A	 MA153
 2SD2136	 PQVDS1ZB40F1	 MA4180 MA4300	 PQVDMZJ6R2 MA4020
 1SS119 MA723	 MA111 MA8051 MA8039	 PQVDPY1112H, PQVDSML210LT	 PQVDS5688G

13.2. Handset

 MN101C10AKC	 AN6139FA	 PQVTDTC143E, 2SD1819A, PQVTDTC123E, PQVTDTA143TU, PQVTD123T146
 MA8150, MA111 MA728	 PQVDPTZTE25, MA736	 LN308G8JRA, PQVDSML310MT

14 FOR SCHEMATIC DIAGRAM

14.1. Base Unit

Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

> Important Safety Notice:
> Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

This schematic diagram may be modified at any time with the development of new technology.

14.2. Handset

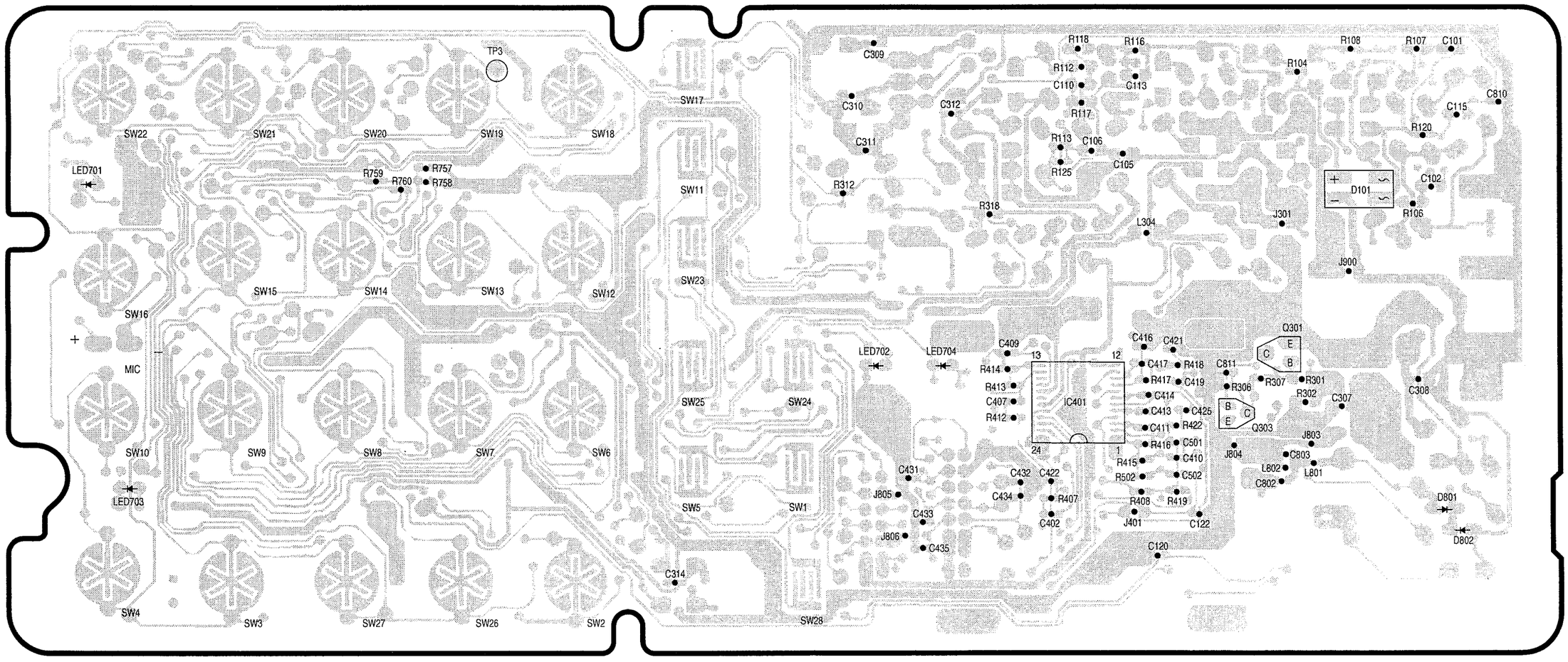
Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

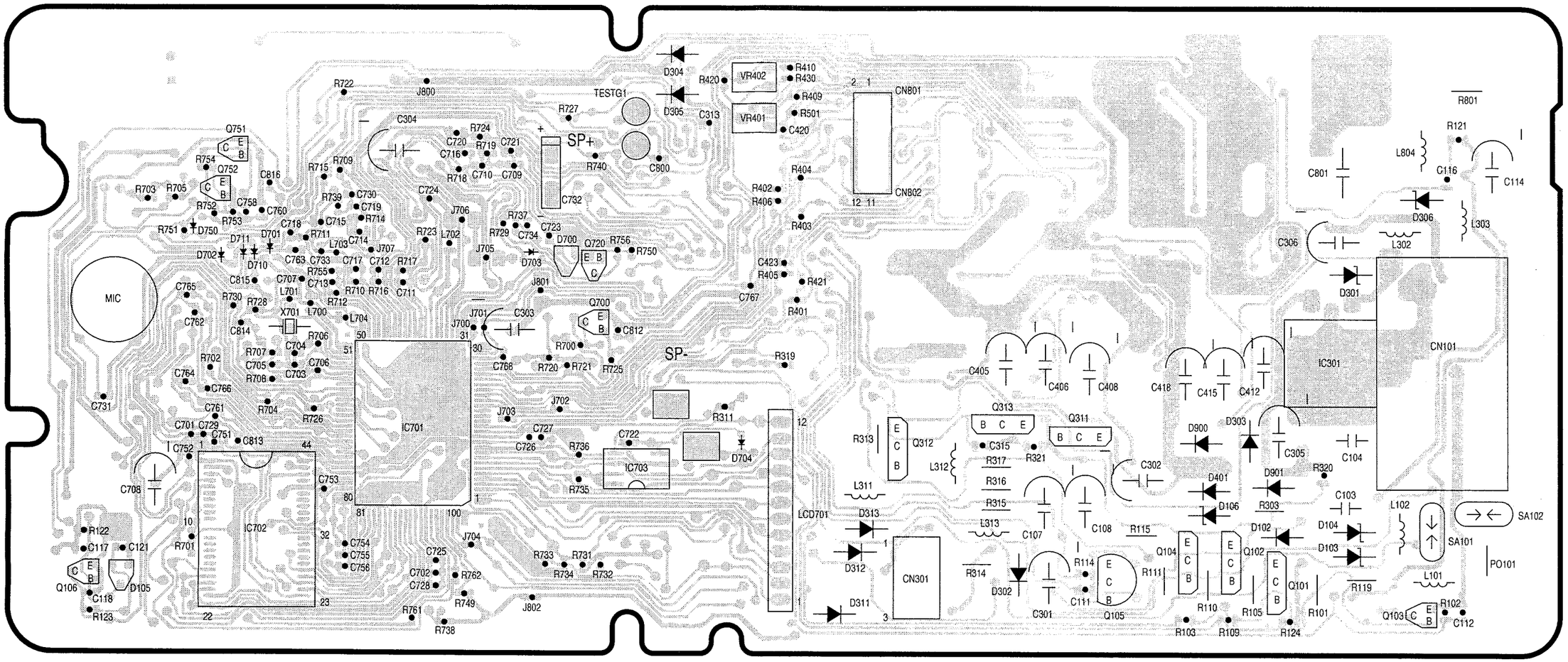
This schematic diagram may be modified at any time with the development of new technology.

15 CIRCUIT BOARD (Base Unit)

15.1. Flow Solder Side View

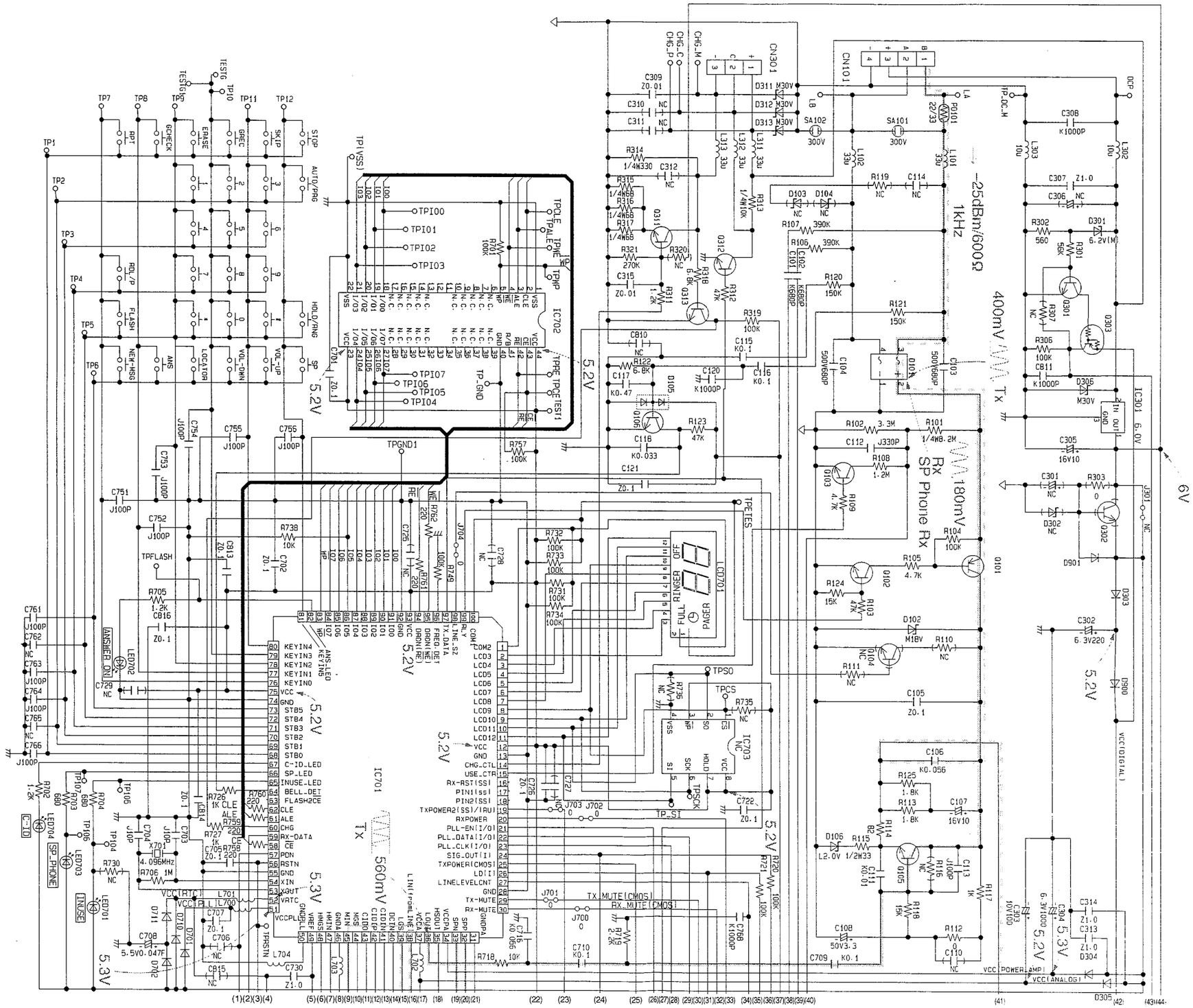


15.2. Component View (Base Unit)

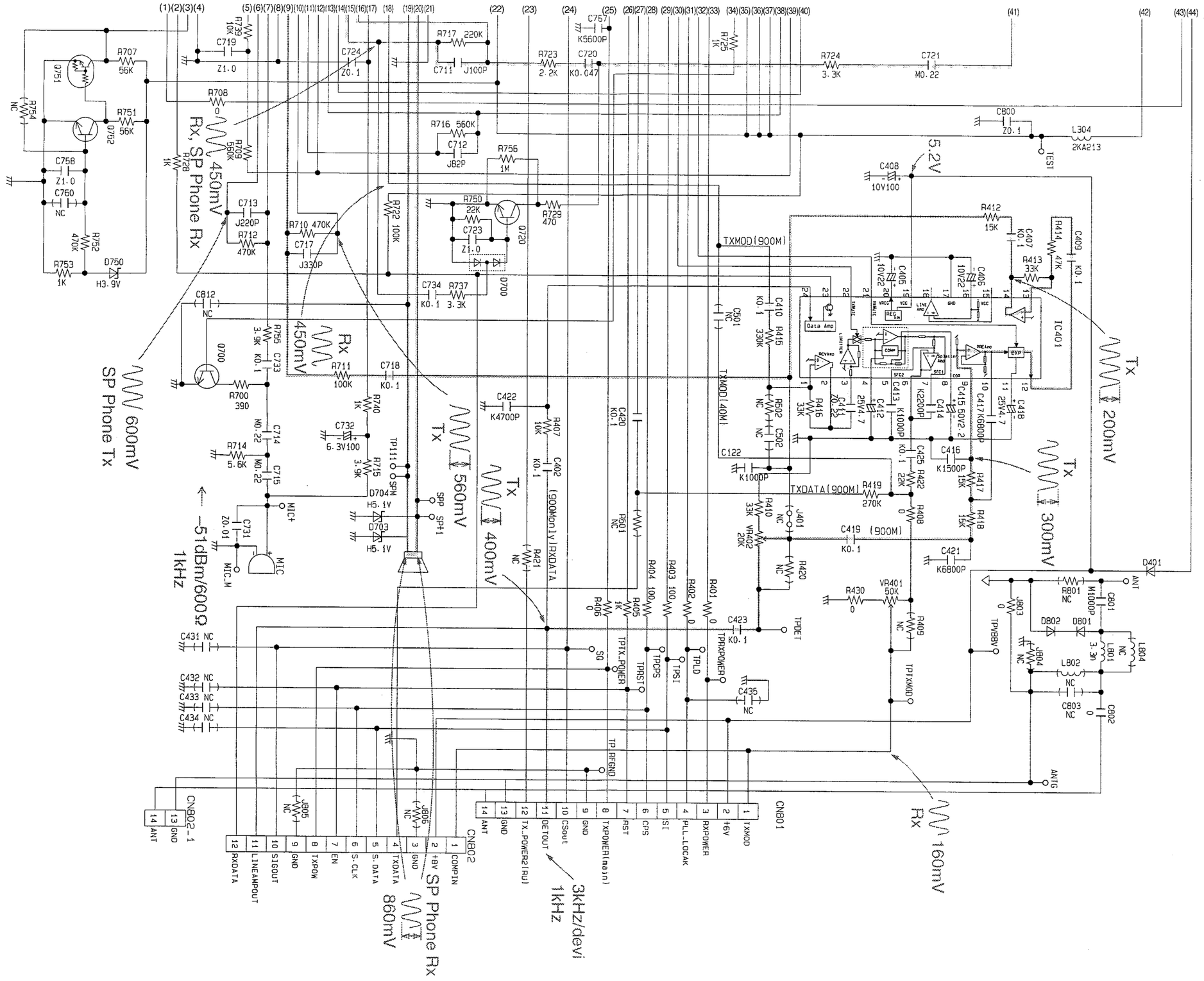


16 SCHEMATIC DIAGRAM (Base Unit)

16.1. Base Unit No. 1

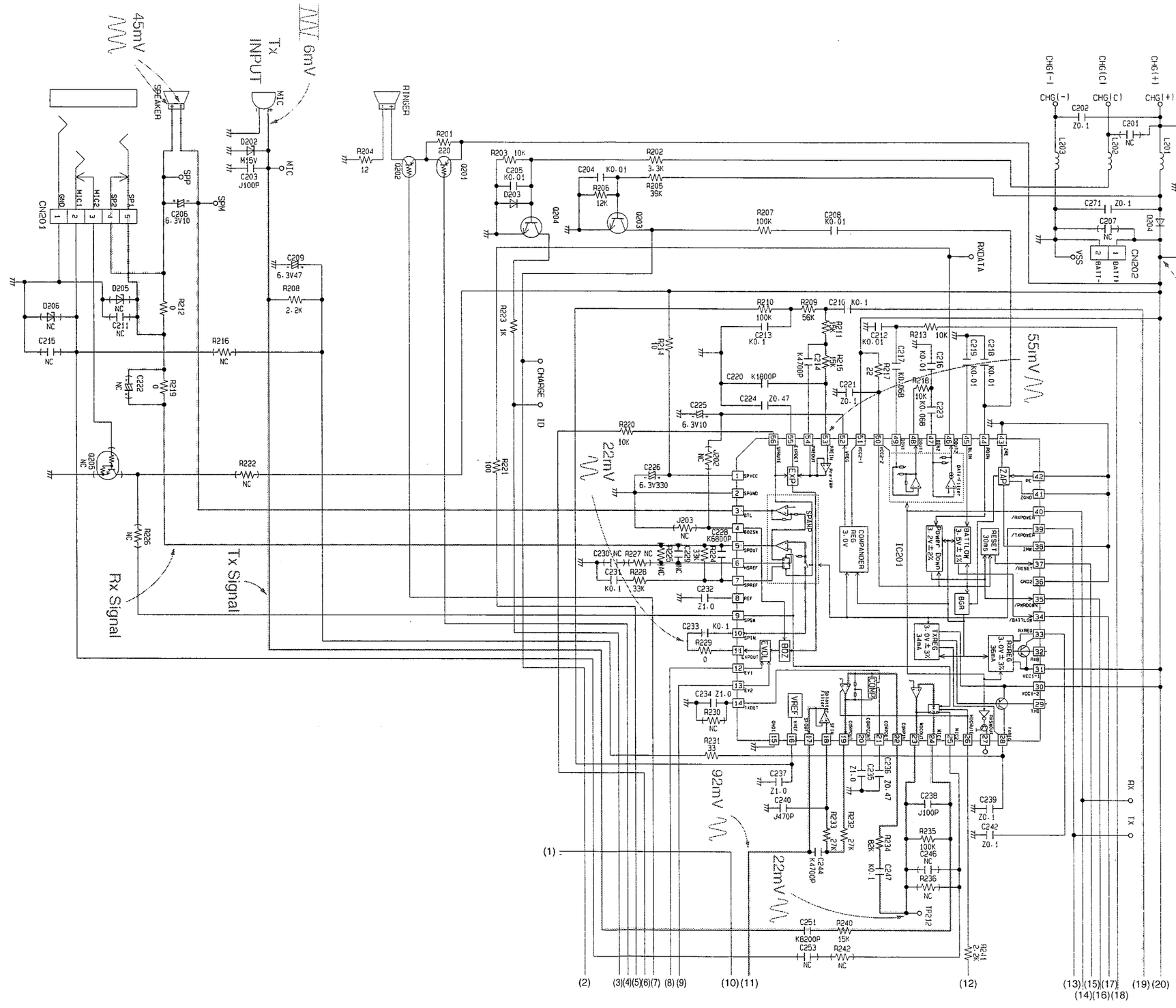


16.2. Base Unit No. 2

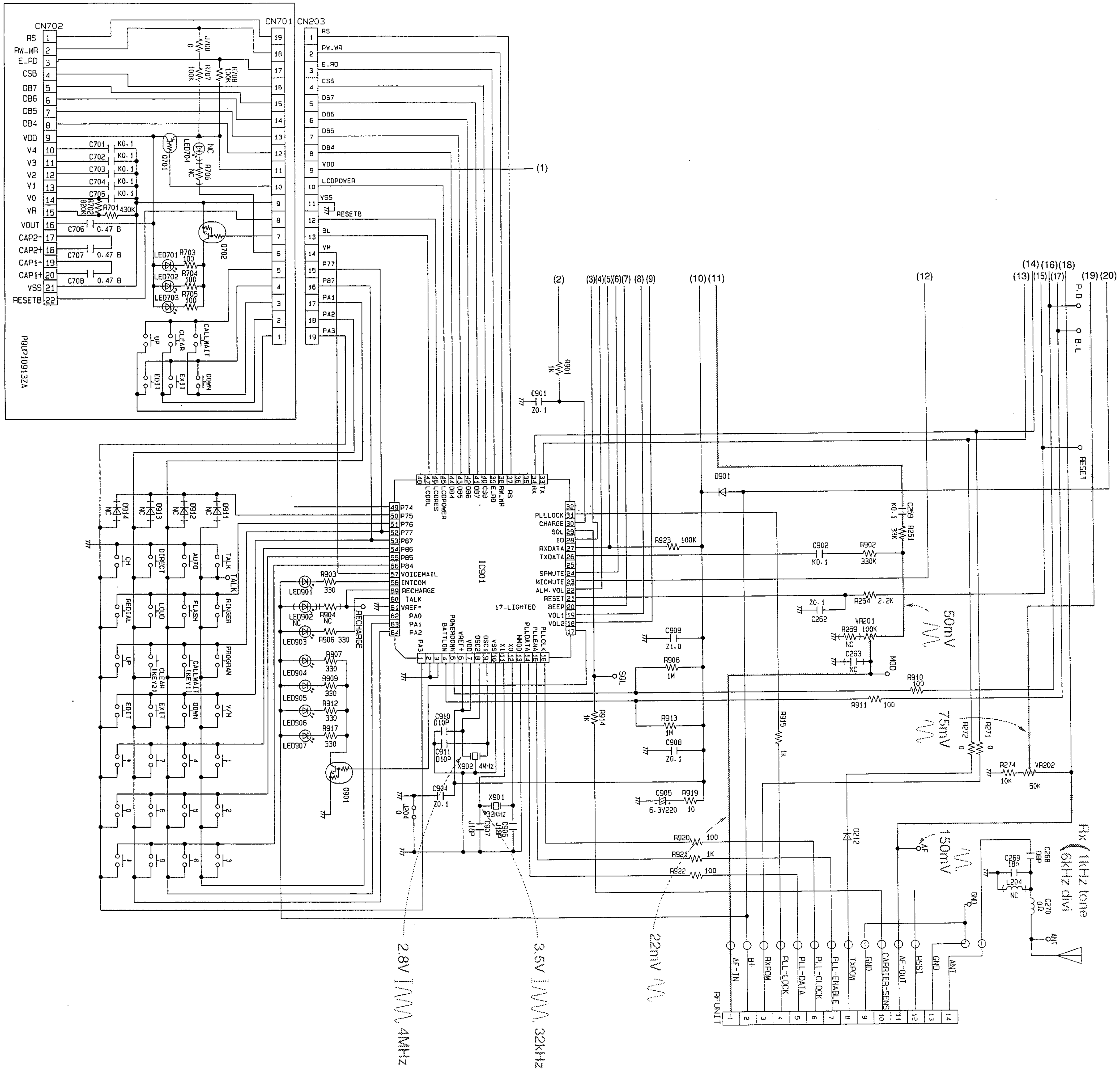


17 SCHEMATIC DIAGRAM (Handset)

17.1. Handset No. 1



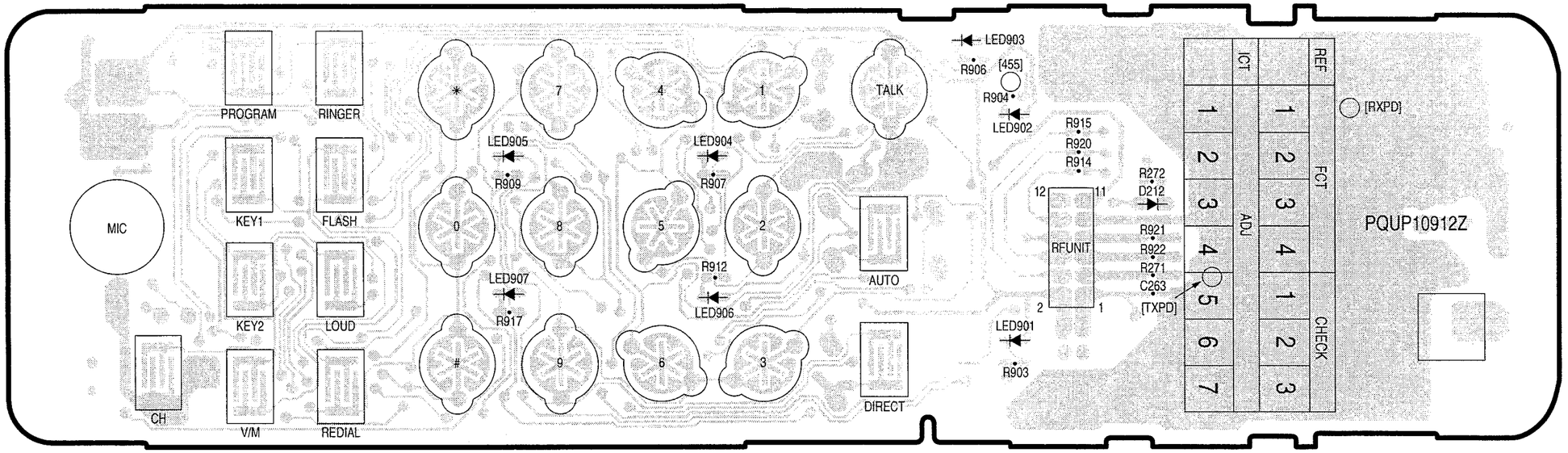
17.2. Handset No. 2



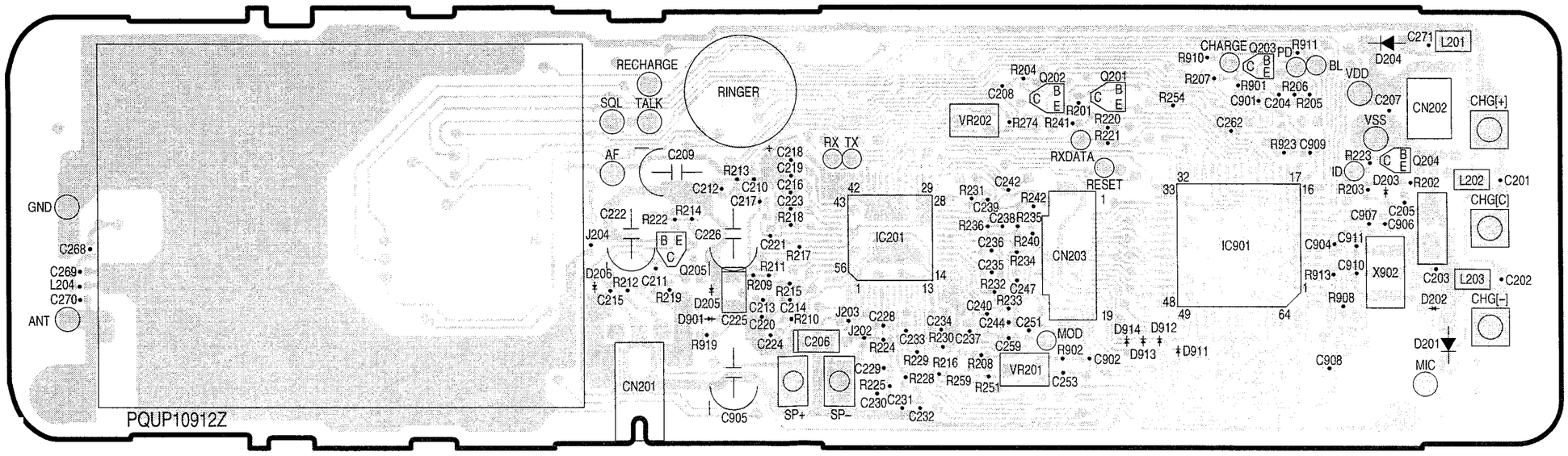
18 CIRCUIT BOARD (Handset)

18.1. Main P.C. Board

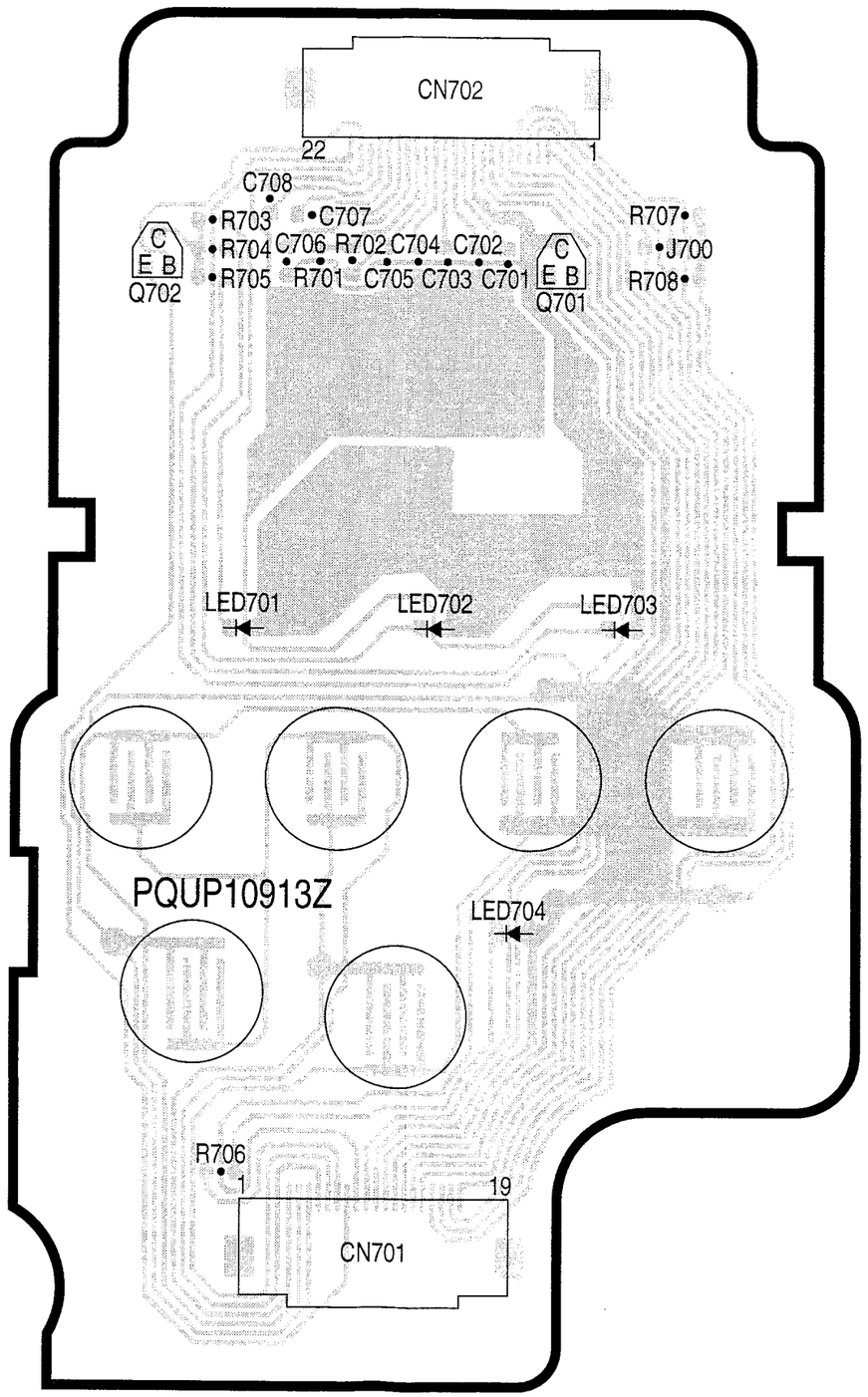
(Component View)



(Flow Solder Side View)

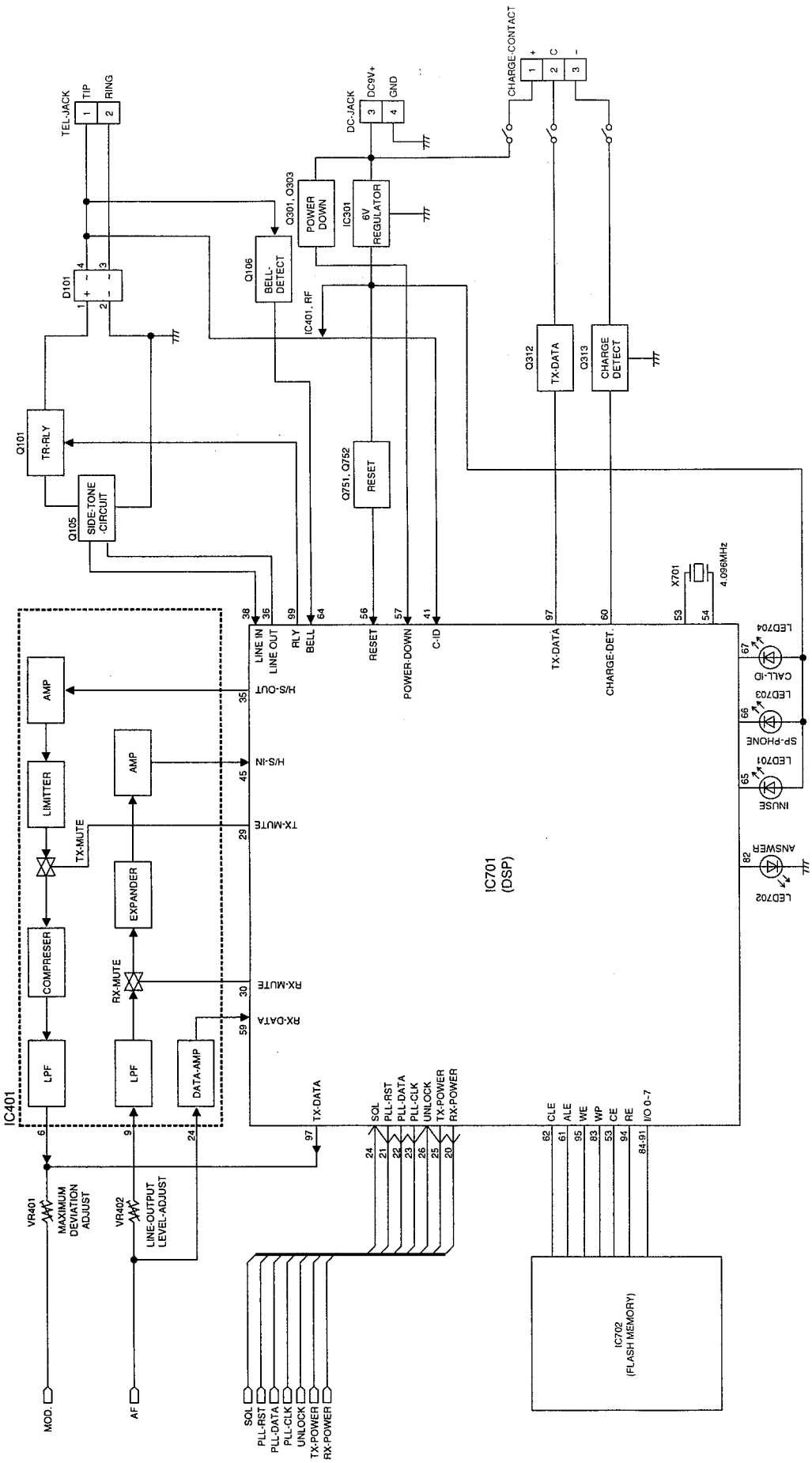


18.2. Sub P.C. Board (Handset)



19 BLOCK DIAGRAM (Base Unit)

19.1. Main P.C. Board



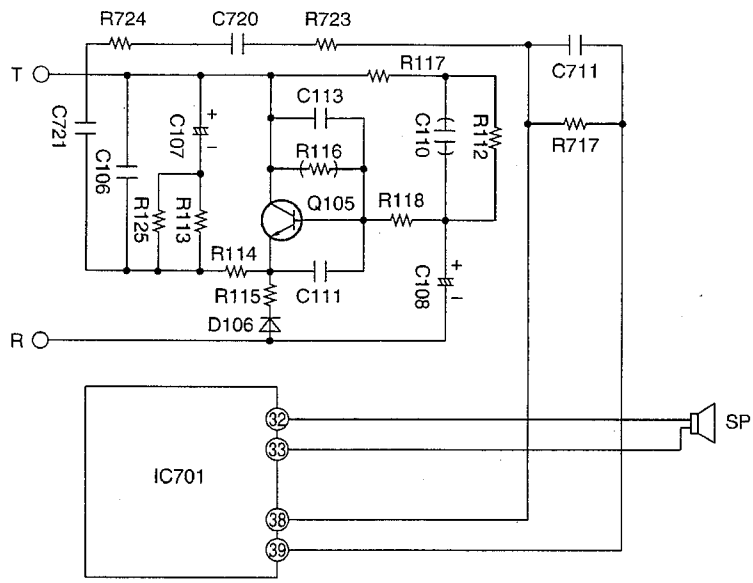
20 NEW CIRCUIT OPERATION (Base Unit)

20.1. SP-PHONE RX Circuit

Circuit Operation:

Telephone Line → C721 → R724 → C720 → R723 → pin 38 of IC703 → pins 32 and 33 of IC701 → Speaker

Circuit Diagram

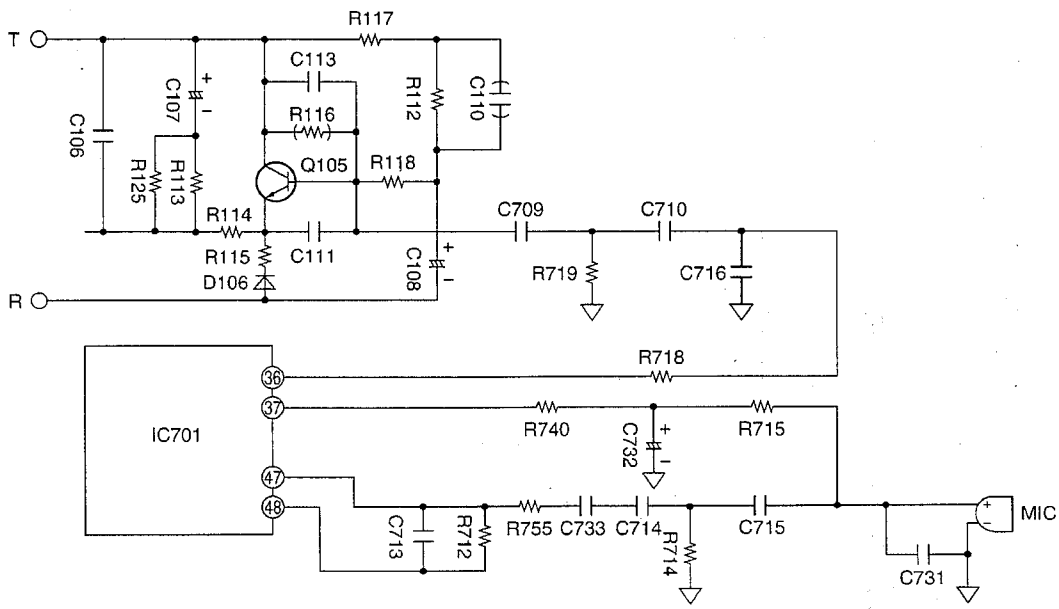


20.2. SP-PHONE TX Circuit

Circuit Operation:

MIC → C715 → C714 → C733 → R755 → pin 47 of IC701 → pin 36 of IC701 → R718 → C710 → C709 → Telephone Line

Circuit Diagram



20.3. Auto Disconnect Circuit

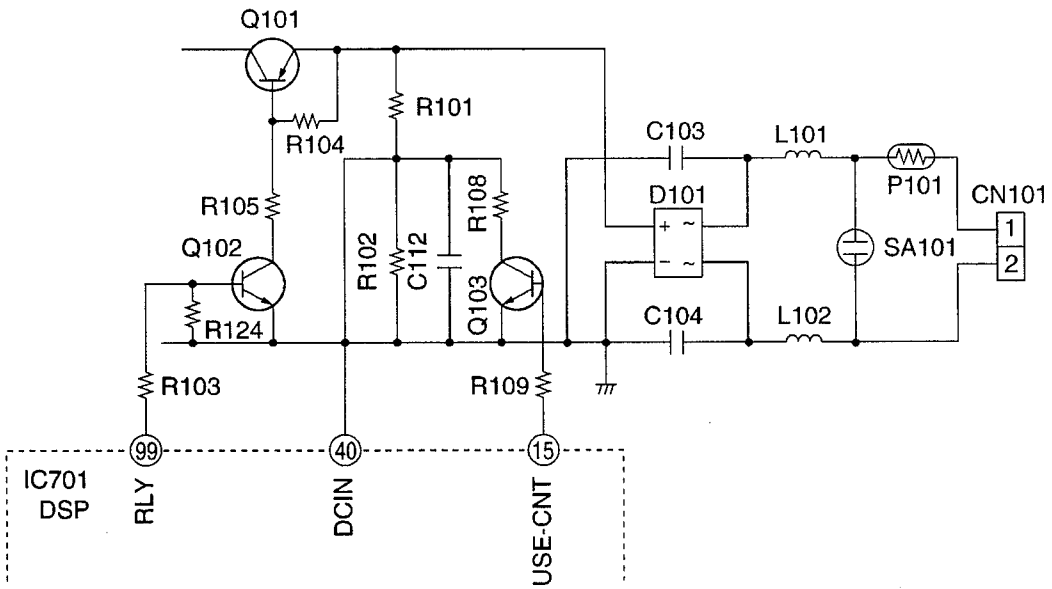
Function:

This circuit is used to detect the fact that another telephone connected to the same line is OFF-HOOK while the unit is in a receiving status or OGM transmitting status.

Circuit Operation:

The voltage pin 40 of IC701 is monitored. If a parallel-connected telephone is put into an OFF HOOK status, the presence/absence of a parallel connection is determined when the voltage changes by 0.2V or more.
When the set detects tha parallel-connected telephone is OFF HOOK status, the line is disconnected.

Circuit Diagram



20.4. Power Supply Circuit

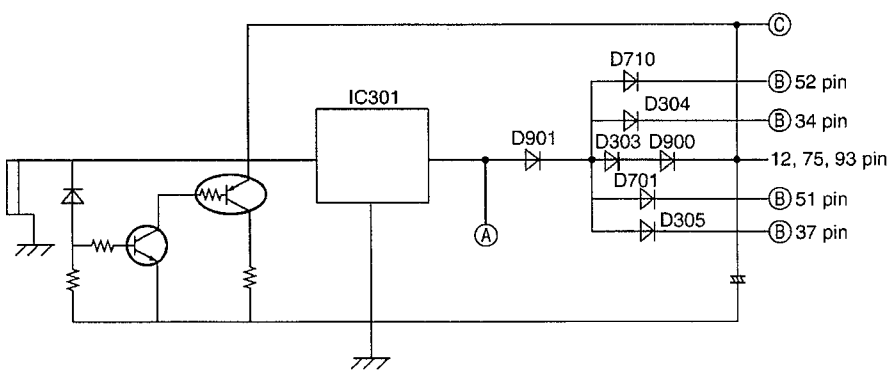
Function:

Power from the AC adaptor passes through a regulating block consisting of IC301.

Circuit Operation:

IC301 is a regulated power supply. The voltage at point A is regulated to 6 V by IC301.
The voltage at point B is dropped by D901, D304~D305, D701 and D710 to 4.6 V.
The voltage at point C is dropped by D303, D900 to 4.1 V.

Circuit Diagram



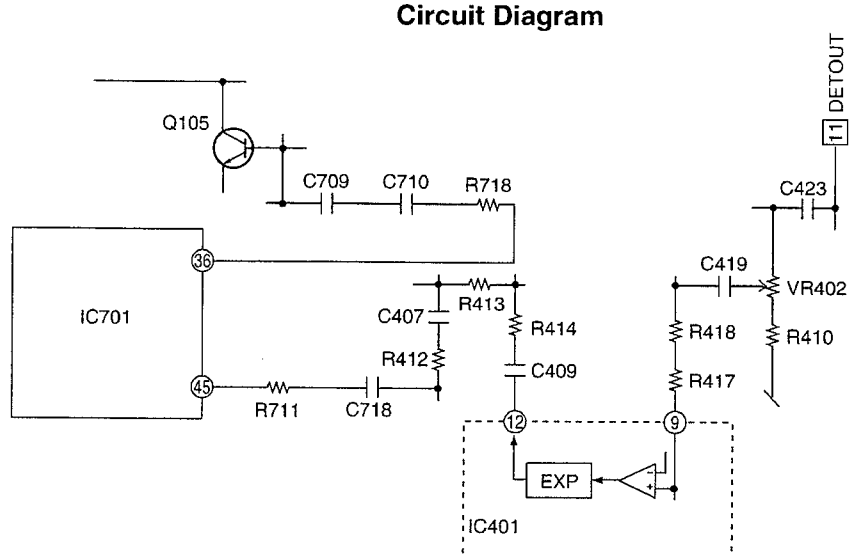
20.5. DTMF Signal

When the DTMF data from the Handset is received, the DTMF signal is output from pin 36 of the DSP and sent to the line through Q105.

20.6. Line Sending Signal

The AF signal output from the AF terminal of the RF unit is adjusted to the appropriate level by VR402 and input to IC401. The RX DATA signal from the handset is muted at this point by IC401 Exp to prevent the RX DATA from leaking onto the line. IC401 comprises a 3 kHz LPF and an expander IC. The signal compressed by the handset is expanded, recreating it as a normal signal. The output from the expander passes through IC701, and is input to telephone line.

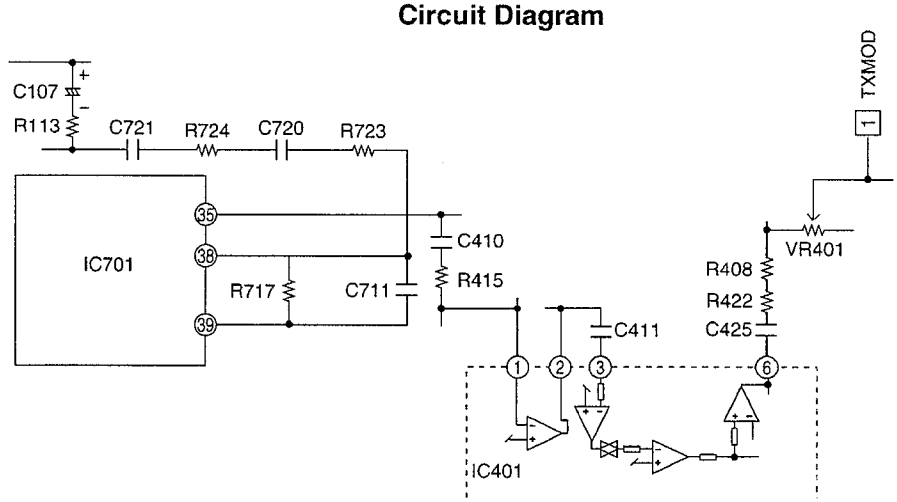
Circuit Diagram



20.7. Line Receiving Signal

The audio signal from line passes through IC701 and is input to IC401. IC401 comprises an amplifier, limiter, mute circuit, compander, and 3 kHz LPF. It performs signal processing. The audio signal output from pin 6 of IC401 is mixed with the TX DATA. At this point (in the talk mode), the DTMF tones, pulse dial tones, and data transferred between the Handset and base unit is input to the modulator circuit.

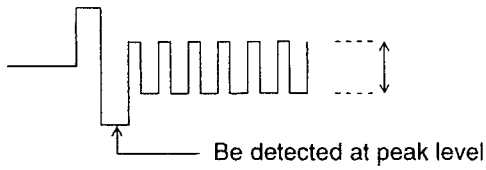
Circuit Diagram



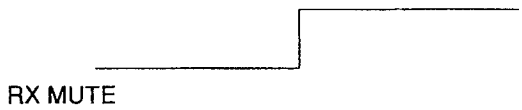
20.8. RX Data Circuit/Hard Mute Circuit

The AF signal output from the RF unit is filtered and amplified by a filter amplifier with a 500 Hz cutoff connected to pins 24 through 23 of IC401. The resulting demodulated data waveform is then input to RX DATA pin 59 of the IC701.
If there is data from the handset during talk operation, the handset data is as shown below to prevent the data from leaking onto the line. After the data arrives to DSP, muting is applied by the DSP.

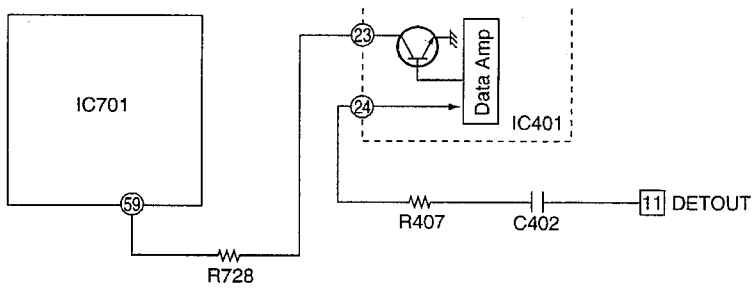
Timing Chart



Circuit Diagram



Circuit Diagram



20.9. ID Code Setting

When the Handset is placed on the base unit, new ID data is output from pin 97 of the CPU after the charge detector operates. After passing through data amplifier Q312 and the charge terminal, the data is sent to the Handset.

20.10. Calling Line Identification Circuit (Caller ID)

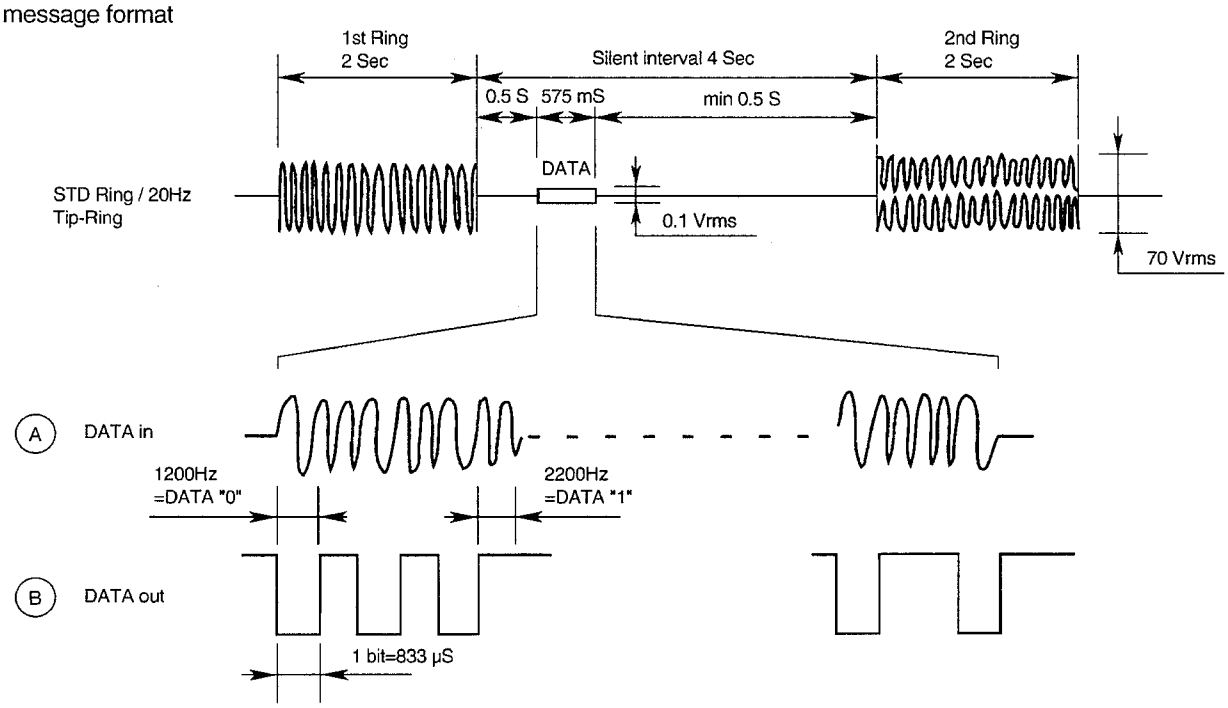
Function:

The caller ID is a chargeable ID which the user of a telephone circuit obtains by entering a contract with the telephone company to utilize a caller ID service. For this reason, the operation of this circuit assumes that a caller ID service contract has been entered for the circuit being used.

The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) format. Data "0" is a 1200 Hz sine wave, and data 1 a 2200 Hz sine wave.

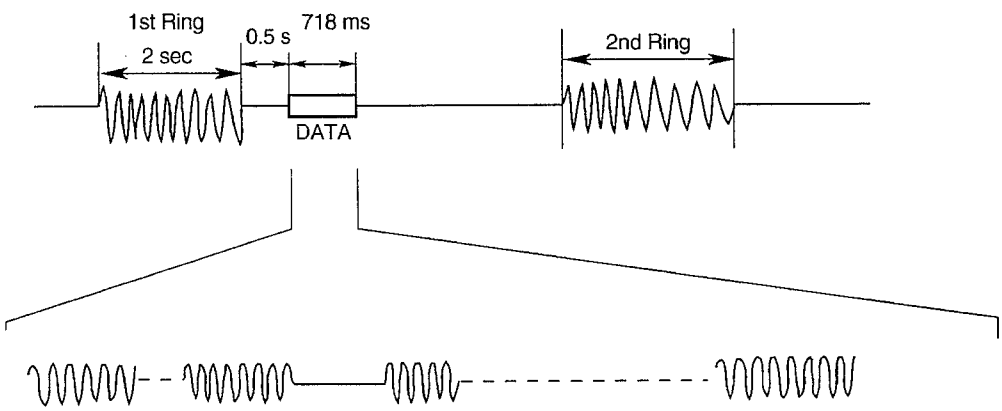
There are two type of the message format which can be received: i.e. the single message format and plural message format. The plural message format allows to transmit the name and data code information in addition to the time and telephone number data.

- Single message format



month	day	hour	minute	number
04 -	15 -	16 -	35 -	2013487000

- Plural message format



DATA CODE	NAME
201	John Smith

month	day	hour	minute	number
04 -	16 -	16 -	35 -	2013487000

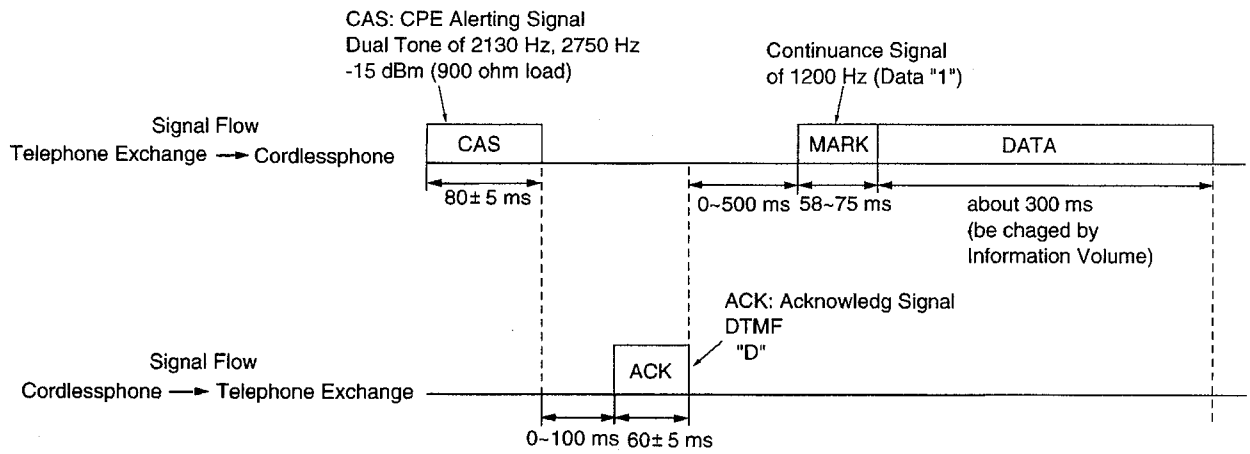
●Call Waiting

Calling Identity Delivery on Call Waiting (CIDCW) is a CLASS service that allows a customer, while off-hook on an existing call, to receive information about a calling party on a waited call. The transmission of the calling information takes place almost immediately after the customer is alerted to the new call so he/she can use this information to decide whether to take the new call.

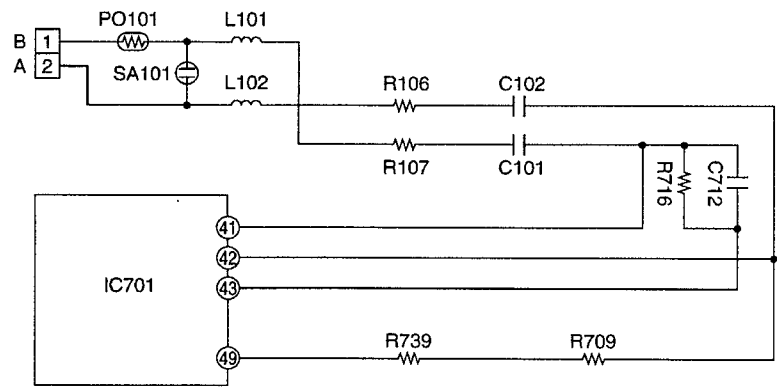
Function:

The CAS signal flows from T/R → R106, R107 collector → C101, C102 → IC701 pins 41~43 and the ACK (DTMF signal) is returned to the telephone exchange. The telephone exchange that received the ACK can send the data in the same manner as the caller ID. If the unit deems that a telephone connected in parallel is in use, ACK is not returned even if CAS is received, and the information for the second and subsequent callers is not displayed on the portable handset display.

Call Waiting Format



Circuit Diagram



20.11. Parallel Connection Detection Circuit

Function:

In order to disable call waiting and stutter tone functions when using telephones connected in parallel, a circuit that determines whether a telephone connected in parallel is in use or is not needed. This circuit determines whether the telephone connected in parallel is on hook or off hook by detecting changes in the T/R voltage.

Circuit Operation:

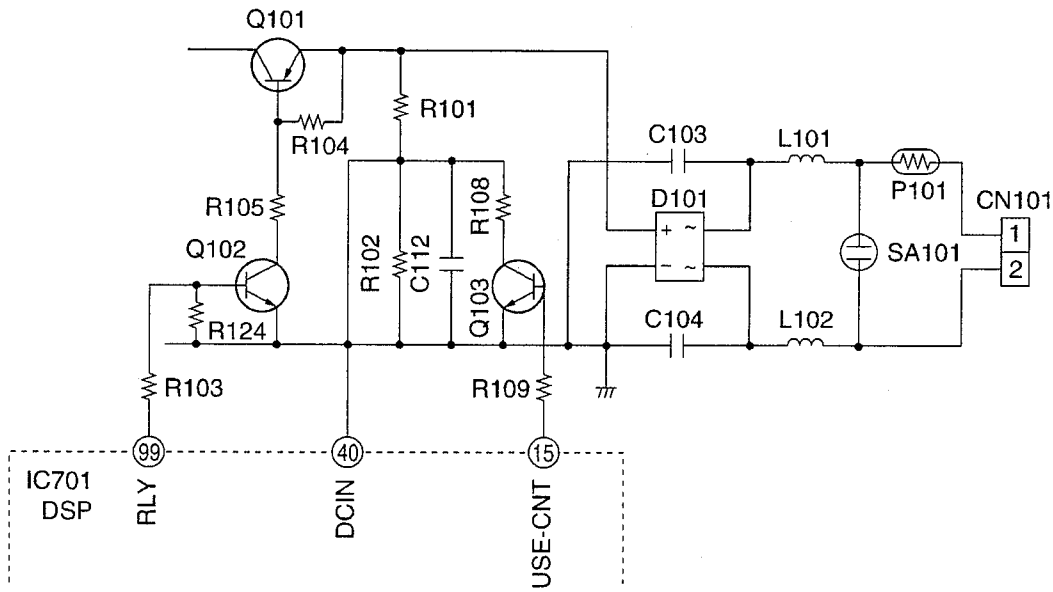
Parallel connection detection when on hook:

When on hook Q103 is ON, the voltage is monitored pin 40 of IC701. There is no parallel connection if the voltage is 1.65 V or higher, while a parallel connection is deemed to exist if the voltage is lower.

Parallel connection detection when off hook:

When off hook Q103 is OFF, the voltage is monitored pin 40 of IC701; the presence/absence of a parallel connection is determined when the voltage changes by 0.2 V or more.

Circuit Diagram



20.12. DSP (Digital Speech/Signal Processing) Circuit

General Description:

(IC701~IC702) is a digital speakerphone/speech/signal processing system that implements all the functions of speech compression, record and playback, and memory management required in a digital telephone answering machine.

The DSP system is fully controlled by a host processor IC701. The host processor provides activation and control of all that functions, such as speech Recording, Playback, Tone detecting and Line monitoring.

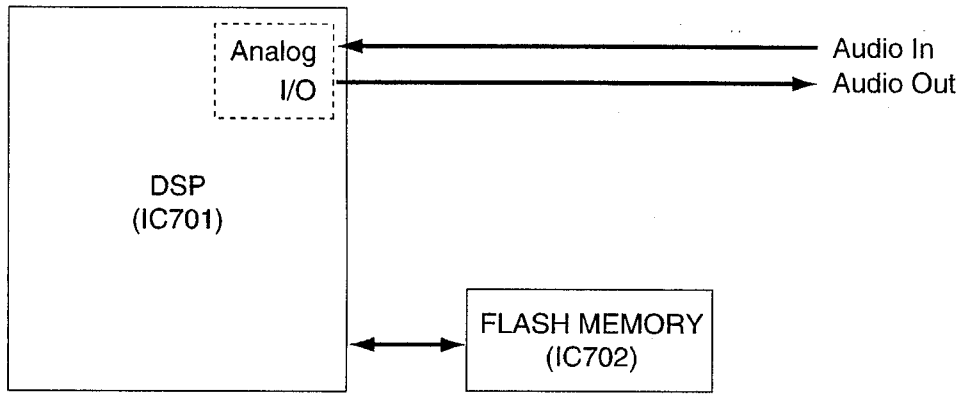
The DSP system comprises of following.

— a Host Processor.

— a Digital Signal Processor which includes the firmware implemented functions.

— a FLASH MEMORY (IC702), which is used for stored voice messages and synthesized voice.

Circuit Diagram



- **Voice Message Recording**

  The DSP system use a proprietary speech compression technique to record and store voice message in FLASH MEMORY (IC702).

  An error correction algorithm is used to enable playback of these messages from the FLASH MEMORY (IC702).

- **DTMF Detection**

  The DTMF detection is implemented by the DSP system in software. The DTMF detection is performed during Record, Playback, and Line Monitoring modes of operation.

- **Synthesized Voice**

  The DSP implements synthesized Voice, utilizing the built in speech detector and an FLASH MEMORY (IC702), which stored the vocabulary.

- **Caller ID and Call Waiting CID demodulation**

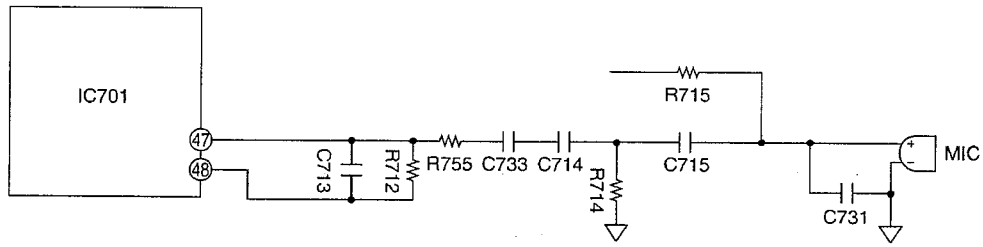
  The DSP implements monitor and demodulate the FSK signals that provide CID information from the Central Office.

20.13. Greeting Recording Circuit

Circuit Operation:

MIC → C715 → C714 → C733 → R755 → pin 47 of IC701.

Circuit Diagram

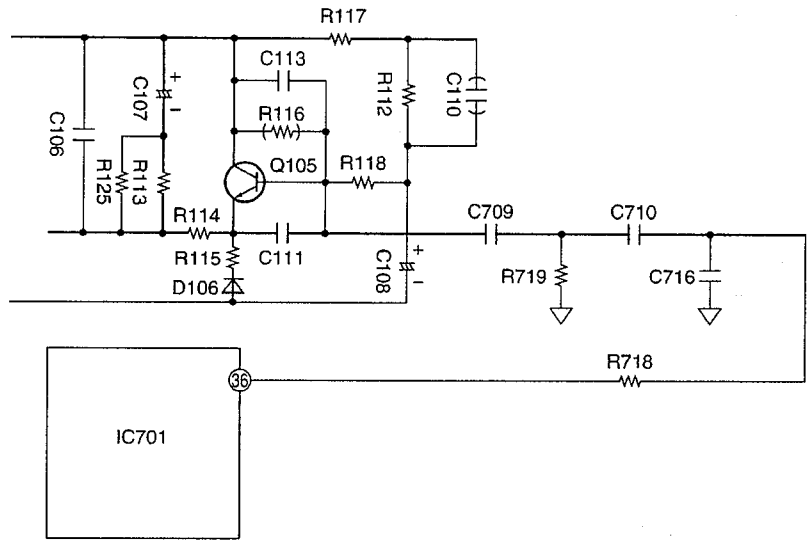


20.14. Greeting Play Back Circuit

Circuit Operation:

IC701 → R718 → C710 → C709 → Telephone Line.

Circuit Diagram

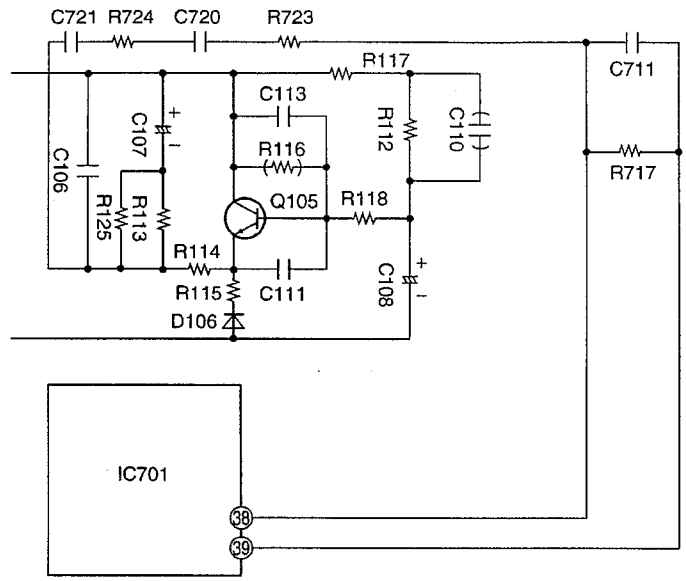


20.15. ICM Recording Circuit

Circuit Operation:

Telephone Line → C721 → R724 → C720 → R723 → pin 38 of IC701.

Circuit Diagram

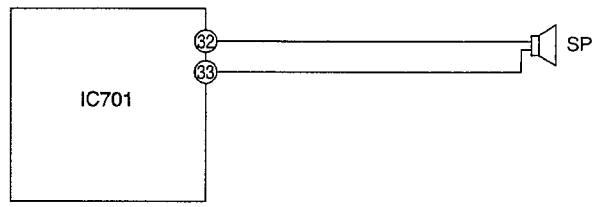


20.16. ICM Play Circuit

Circuit Operation:

pins 32 and 33 of IC701 → Speaker.

Circuit Diagram



20.17. Telephone Line Interface

Circuit Operation:

● **ANSWER**

In the idle mode, Q101 is open to cut the DC loop current and decrease the ring load. When ring voltage appears at the Tip (T) and Ring (R) leads (When the telephone rings), the AC ring voltage is transferred as follows:

T → PO101 → L101 → R121 → C116 → Q106 → IC701 pin 64.

When the CPU (DSP) detects a ring signal, Q101 turns on, thus providing an off-hook condition (active DC current flow through the circuit) and the following signal flow is for the voice signal.

T → PO101 → D101 → Q101 → Q105 → R115 → D106 → D101 → R

● **ON HOOK**

Q101 is open, Q101 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

● **SPECIFICATIONS**

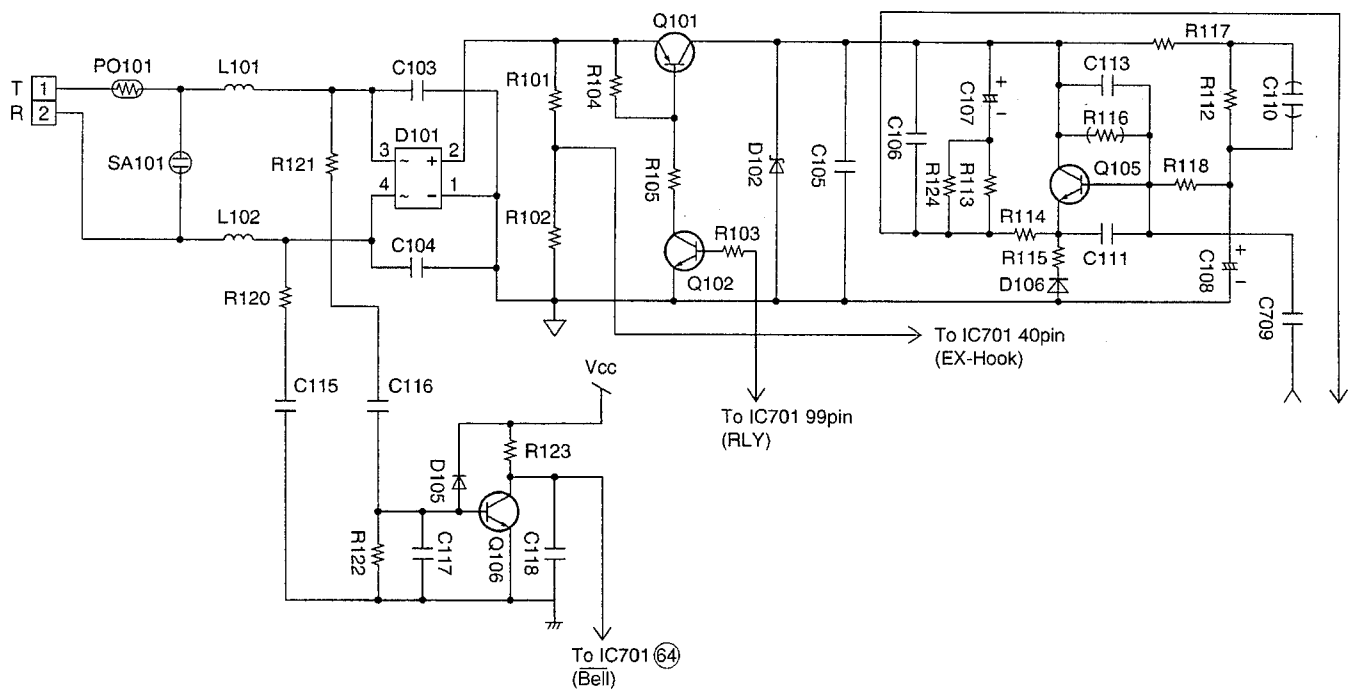
In the on-hook state (idle), the current flows between the telephone line and the unit is as follows:

T → PO101 → L101 → R121 → C116 → R122 → C115 → R120 → L102 → R.

The DC component is blocked by C115, C116: thereby providing an on-hook condition.

The AC interface impedance is over 47 kΩ; thus, satisfying the telephone company requirements.

Circuit Diagram



20.18. Intercom Mode

1. When the base unit LOCATOR/INTERCOM button is pressed, a call monitor signal (intercom sound) is output from pins 32 and 33 of C701. Thus a monitor tone is heard from the speaker.
2. At the same time, pin 25 of IC701 goes "Low", and the transmission state is reached. Then the modulated data signal is output from pin 97 of IC701. Flashing of the IN USE/CHARGE (LED701) is obtained from pin 65 of IC701. This status is called "Intercom stand-by".
3. The receiving signal flows:
   RF → pin 11 of CN801 → C423 → VR402 → C419 → R418 → R417 → pin 9 of IC401 → pin 12 of IC401 → C409 → R414 → R413 → C407 → R412 → C718 → R711 → pin 45 of IC701 → pins 32 and 33 of IC701 → SP
4. The transmission signal flows:
   MIC → C715 → C714 → C733 → R755 → pin 47 of IC701 → pin 35 of IC701 → C410 → R415 → C411 → pin 3 of IC401 → pin 6 of IC401 → C425 → R422 → R408 → VR401 → pin 1 of IC801 → RF

20.19. Initializing Circuit

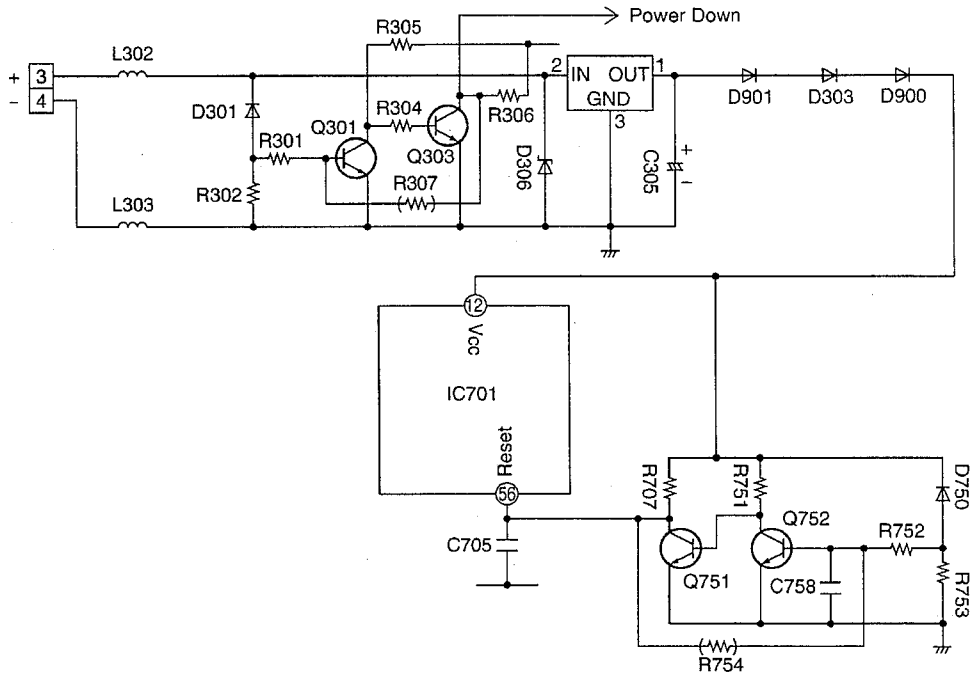
Function:

This circuit is used for to initialize the microcomputer when it incorporates an AC adaptor.

Circuit Operation:

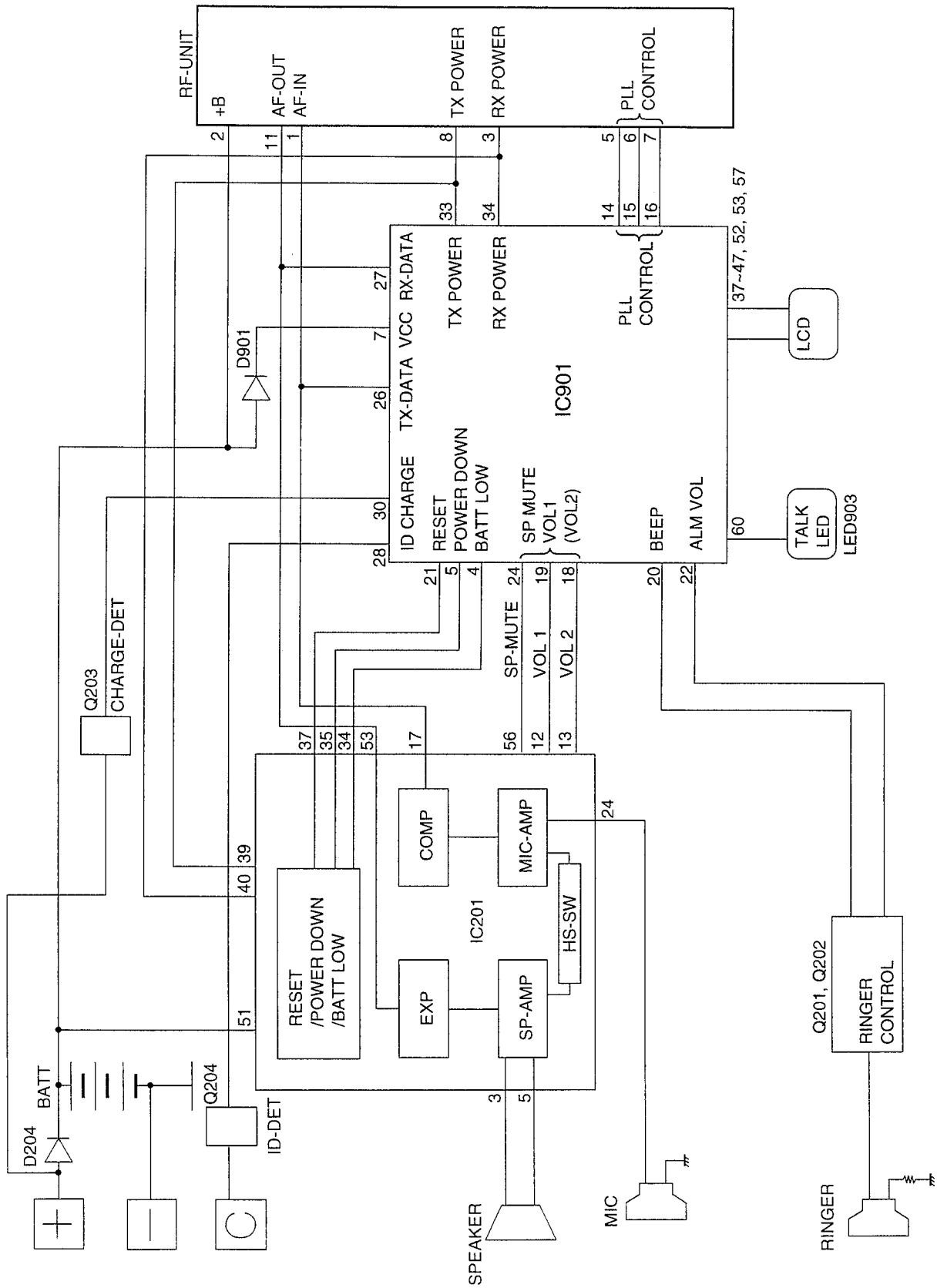
When the AC Adaptor is inserted into the unit, then the voltage is shifted by D303 and power is supplied to the CPU. The set can operate beyond point A in the circuit voltage diagram.

Circuit Diagram



21 BLOCK DIAGRAM (Handset)

21.1. Control Block

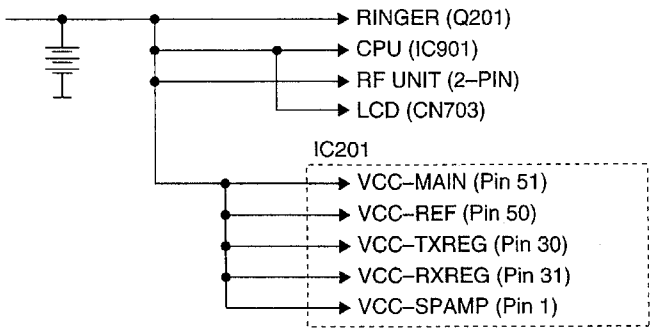


22 NEW CIRCUIT OPERATION (Handset)

22.1. Power Supply Circuit

Voltage is supplied separately to each block.

Circuit Diagram

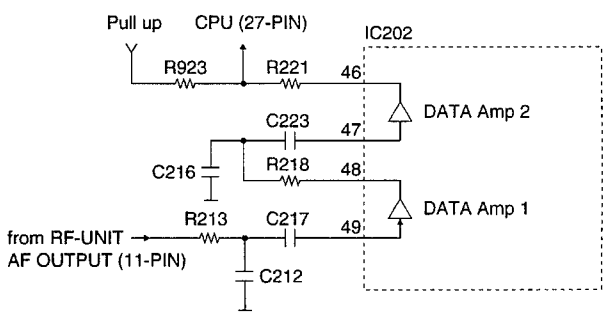


22.2. Data Reception Circuit

The wave detection signal from the RF UNIT has high frequency elements eliminated by a CR filter consisting of R213 and C212. Then it is amplified by DATA Amp1 and, once again, high frequency elements are eliminated by R218 and C216. After this, the signal is amplified by DATA Amp2 and input to pin 27 of the CPU.

The data output waveform is a block pulse.

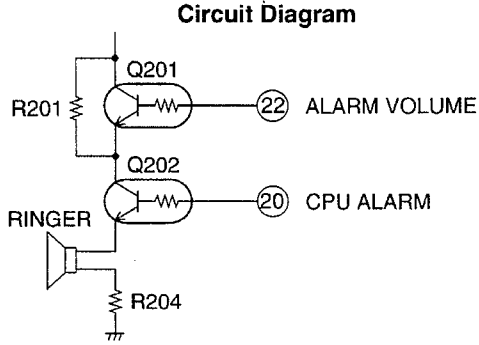
Circuit Diagram



22.3. Ringer Circuit

If the ringer volume is set to low and an alarm tone is output from pin 20 of the CPU and input to Q202. Then Q201 is turned off. If the ringer volume is set to high, Q201 turns on and results in a louder beep tone.

Circuit Diagram



22.4. Reception Signal Circuit

The receiver circuit comprises expander IC201.

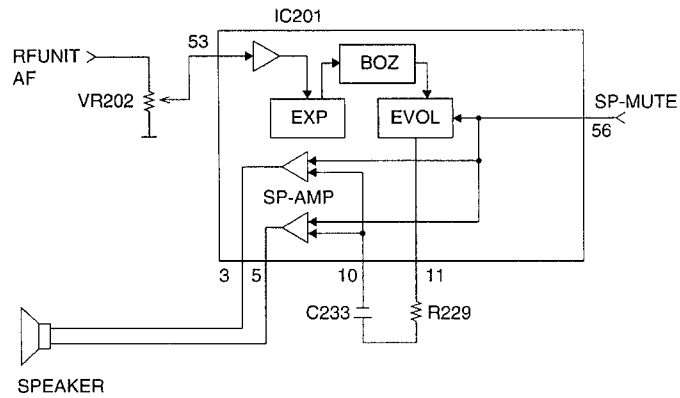
After being adjusted to the appropriate level by VR202, the signal passes through a 3 kHz LPF and an expander built into IC202. If a large input is input to the microphone, the gain control built into lowers the gain to reduce the output of the speaker amplifier. If there is no large input being input to the microphone, the amplifier in IC201 is set to standard gain.

Consequently, the sound of the received audio signal becomes fainter when the user is talking in a loud voice and the side tone level is lowered. When the user talks more softly, the received audio signal is audible at the standard level.

RX VOL	EV1 IC201 (12) pin	EV2 IC201 (13) pin
+7dB	H	L
0dB	L	H
-7dB	L	L

SP MUTE H: SPEAKER OFF
L: SPEAKER ON

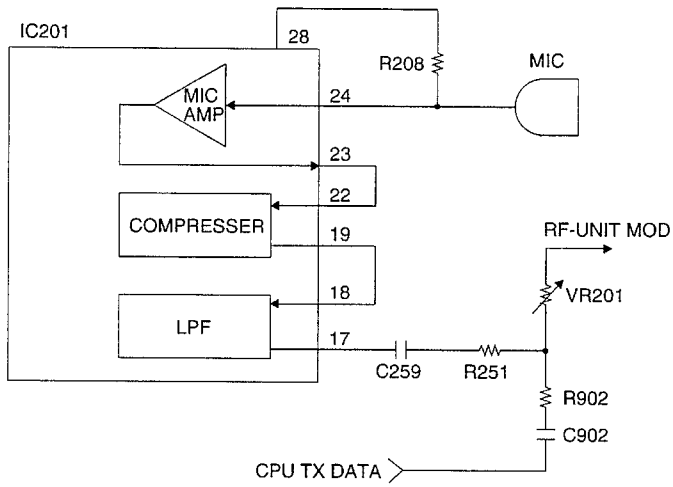
Circuit Diagram



22.5. Sending Signal

The audio signal from the microphone is amplified by Mic Amp, compander, and 3 kHz LPF built into IC201. It is then mixed with the TX DATA signal from the CPU, the modulation is adjusted by VR201, and input to the modulator in the RF UNIT.

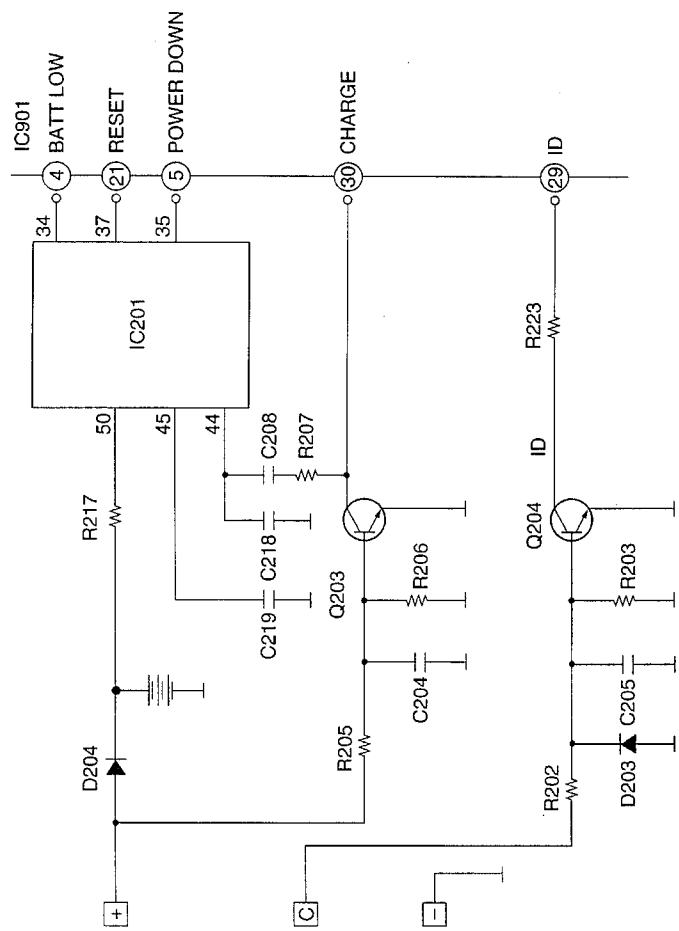
Circuit Diagram



22.6. Reset/Power Down/Battery Low/ID

When the battery is installed in the Handset, the reset circuit consisting of R217 and inside IC201 functions, inputting a reset signal to the CPU. This ensures that the unit will operate normally without the user is needing to switch the power off and on. When the voltage from the batteries drops to 3.5 V, 3.5 V voltage detector inside IC201 operates and output a battery low signal to the CPU. This causes the RECHARGE LED to turn on. If voltage continues to drop and reaches 3.2 V, 3.2 V voltage detector inside IC201 operates and outputs a power down signal to the CPU. This causes power to be cut off automatically and prevents the battery from over discharging. Q203 is a charge detector that informs the CPU whether or not the handset is currently being charged. During charging, ID data is sent from the base unit. Q204 receives this ID data and sends it to the CPU.

Circuit Diagram

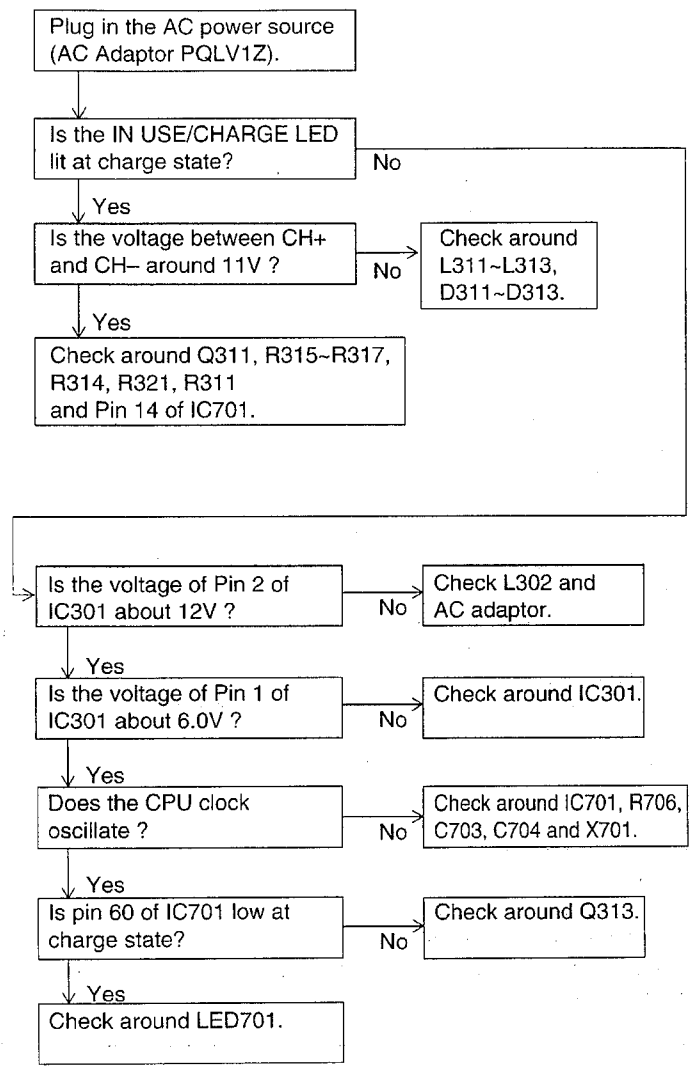


23 TROUBLESHOOTING GUIDE

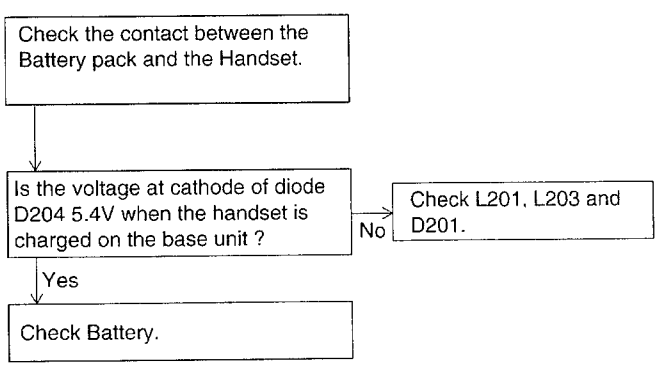
23.1.

Display	Symptom	Remedy
E1	The initialization was tried, but it could not be done.	1. Confirm Flash Memory is equipped. 2. Confirm the connection of Flash Memory. 3. Confirm the power supply of Flash Memory. When no error is found in above-mentioned items, Flash Memory has a defect. Replace Flash Memory.
E2	The defect of Flash Memory was detected.	When Flash Memory has the fatal detect, replace Flash Memory. This error hardly occurs.
E3, E9	When the adjustment data was checked, an error was detected. (The adjustment data may not be written.)	1. Confirm the adjustment data is written. 2. Confirm Flash Memory is equipped. 3. Confirm the connection of Flash Memory. 4. Confirm the power supply of Flash Memory. When no error is found in above-mentioned items, Flash Memory has a defect. Replace Flash Memory.
E4	The defect of DSP was detected. (The chip in DSP may have a defect.)	1. Confirm the connection of DSP. 2. Confirm the oscillation frequency of DSP. When no error is found in above-mentioned items, DSP has a defect. Replace DSP.
E5, E6	The defect of DSP was detected.	When DSP has the fatal defect, replace DSP. This error hardly occurs.
E7	The defect of synthesized voice was detected. (The synthesized voice may not be written.)	1. Confirm the synthesized voice is written. 2. Confirm Flash Memory is equipped. 3. Confirm the connection of Flash Memory. 4. Confirm the power supply of Flash Memory. When no error is found in above-mentioned items, Flash Memory has a defect. Replace Flash Memory.

23.2. Battery won´t Charge (Base Unit)

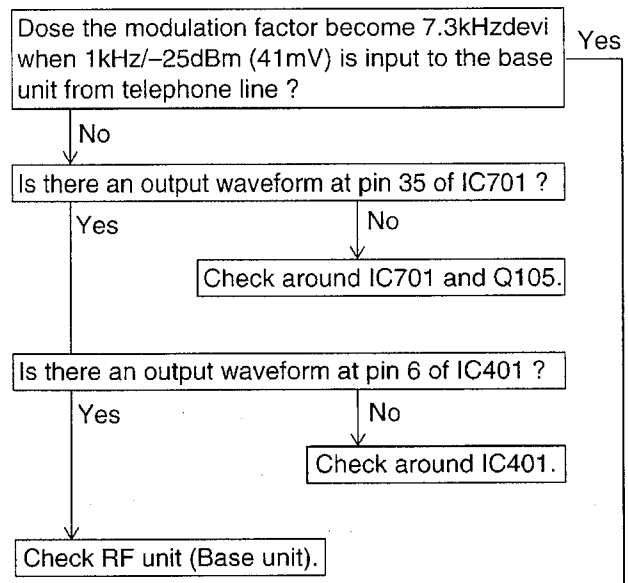

Plug in the AC power source (AC Adaptor PQLV1Z).
Is the IN USE/CHARGE LED lit at charge state?
No
Yes
Is the voltage between CH+ and CH– around 11V ?
No
Check around L311~L313, D311~D313.
Yes
Check around Q311, R315~R317, R314, R321, R311 and Pin 14 of IC701.
Is the voltage of Pin 2 of IC301 about 12V ?
No
Check L302 and AC adaptor.
Yes
Is the voltage of Pin 1 of IC301 about 6.0V ?
No
Check around IC301.
Yes
Does the CPU clock oscillate ?
No
Check around IC701, R706, C703, C704 and X701.
Yes
Is pin 60 of IC701 low at charge state?
No
Check around Q313.
Yes
Check around LED701.

23.3. Battery won´t Charge (Handset)

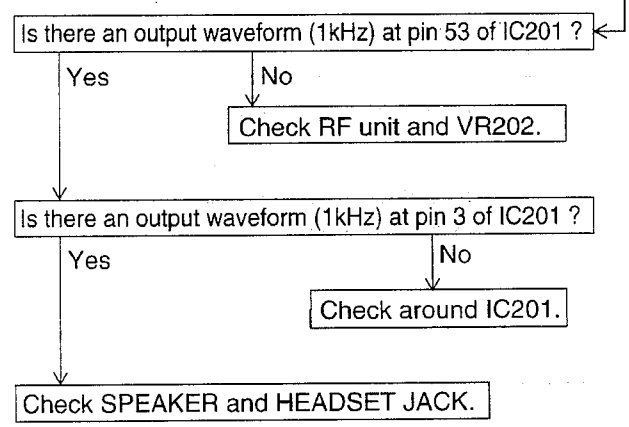

Check the contact between the Battery pack and the Handset.
Is the voltage at cathode of diode D204 5.4V when the handset is charged on the base unit ?
No
Check L201, L203 and D201.
Yes
Check Battery.

23.4. No Voice Reception

BASE UNIT


Dose the modulation factor become 7.3kHzdevi when 1kHz/–25dBm (41mV) is input to the base unit from telephone line ?
Yes
No
Is there an output waveform at pin 35 of IC701 ?
Yes
No
Check around IC701 and Q105.
Is there an output waveform at pin 6 of IC401 ?
Yes
No
Check around IC401.
Check RF unit (Base unit).

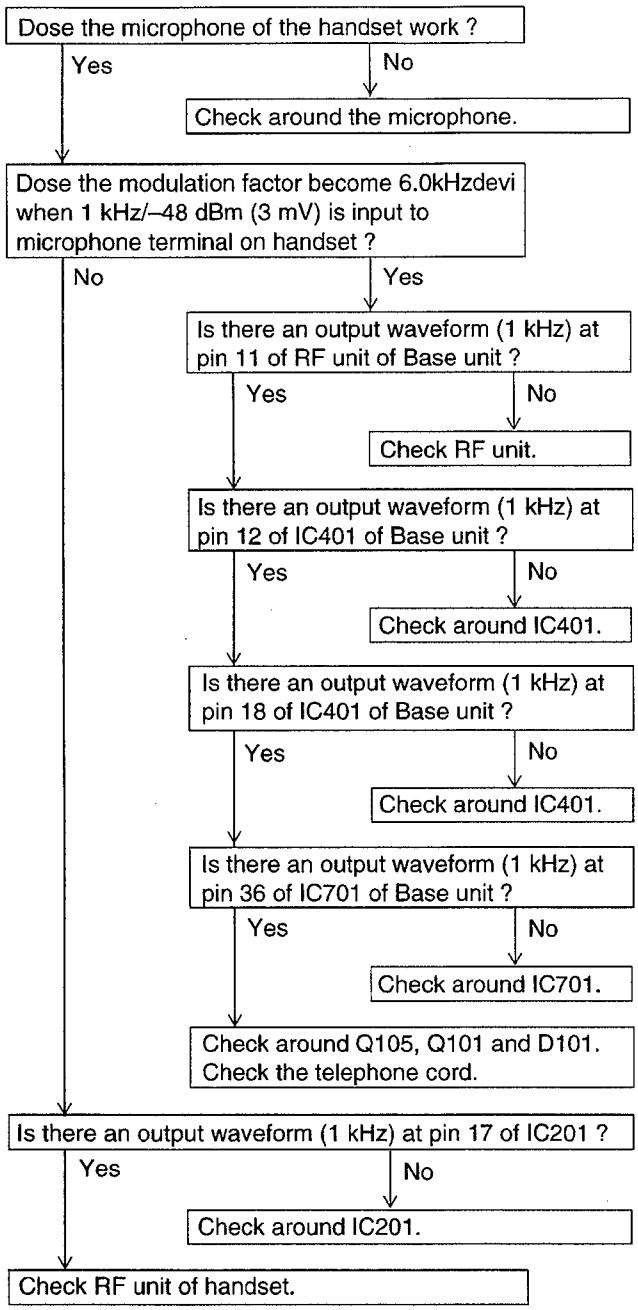
HANDSET


Is there an output waveform (1kHz) at pin 53 of IC201 ?
Yes
No
Check RF unit and VR202.
Is there an output waveform (1kHz) at pin 3 of IC201 ?
Yes
No
Check around IC201.
Check SPEAKER and HEADSET JACK.

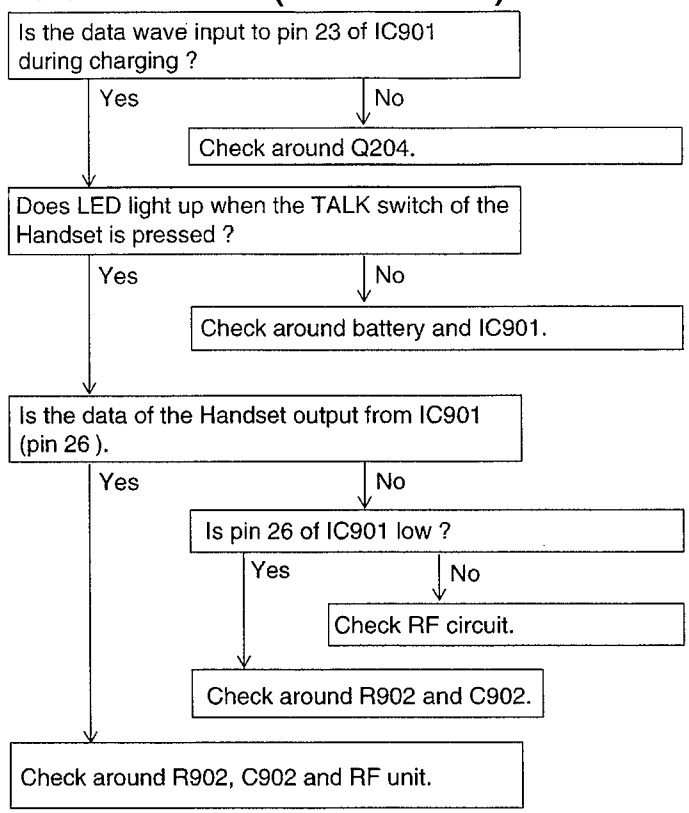
Note:

When checking the RF UNIT, refer to **7. HOW TO CHECK THE RF UNIT**

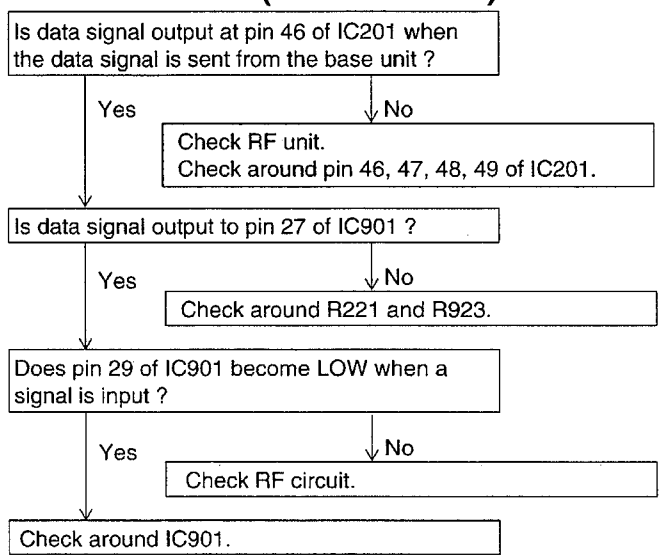
23.5. No Voice Transmission


Dose the microphone of the handset work ?
Yes
No
Check around the microphone.
Dose the modulation factor become 6.0kHzdevi when 1 kHz/–48 dBm (3 mV) is input to microphone terminal on handset ?
No
Yes
Is there an output waveform (1 kHz) at pin 11 of RF unit of Base unit ?
Yes
No
Check RF unit.
Is there an output waveform (1 kHz) at pin 12 of IC401 of Base unit ?
Yes
No
Check around IC401.
Is there an output waveform (1 kHz) at pin 18 of IC401 of Base unit ?
Yes
No
Check around IC401.
Is there an output waveform (1 kHz) at pin 36 of IC701 of Base unit ?
Yes
No
Check around IC701.
Check around Q105, Q101 and D101.
Check the telephone cord.
Is there an output waveform (1 kHz) at pin 17 of IC201 ?
Yes
No
Check around IC201.
Check RF unit of handset.

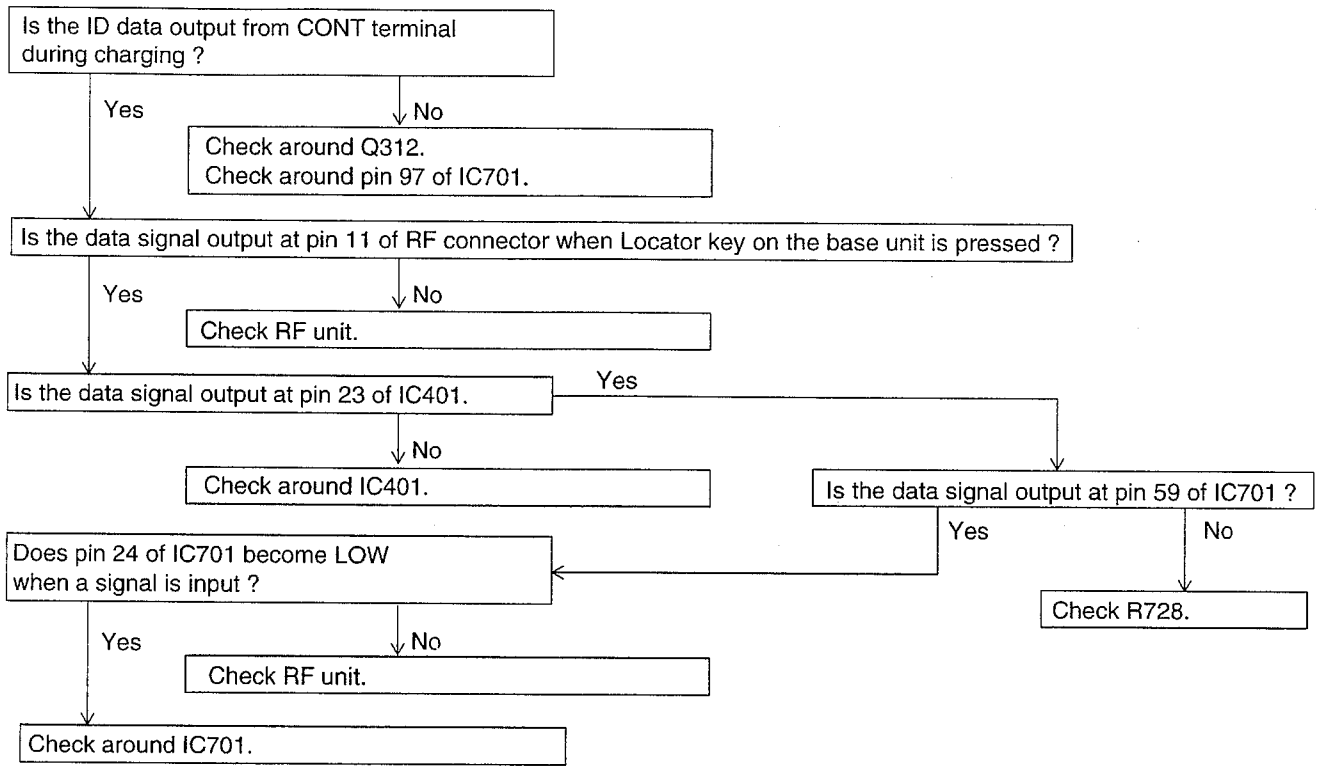
23.6. No Link (Handset TX)


Is the data wave input to pin 23 of IC901 during charging ?
Yes
No
Check around Q204.
Does LED light up when the TALK switch of the Handset is pressed ?
Yes
No
Check around battery and IC901.
Is the data of the Handset output from IC901 (pin 26).
Yes
No
Is pin 26 of IC901 low ?
Yes
No
Check RF circuit.
Check around R902 and C902.
Check around R902, C902 and RF unit.

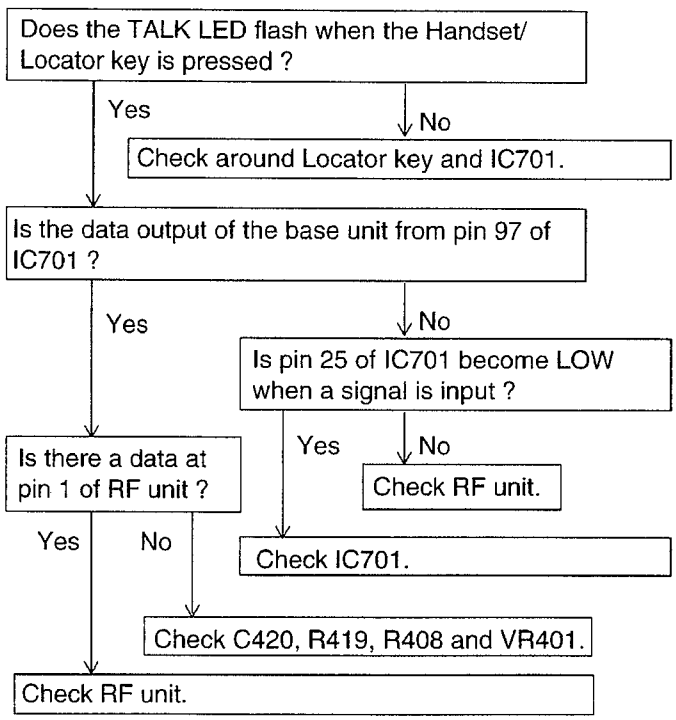
23.7. No Link (Handset RX)


Is data signal output at pin 46 of IC201 when the data signal is sent from the base unit ?
Yes
No
Check RF unit.
Check around pin 46, 47, 48, 49 of IC201.
Is data signal output to pin 27 of IC901 ?
Yes
No
Check around R221 and R923.
Does pin 29 of IC901 become LOW when a signal is input ?
Yes
No
Check RF circuit.
Check around IC901.

23.8. No Link (Base Unit RX)


Is the ID data output from CONT terminal during charging ?
Yes
No
Check around Q312.
Check around pin 97 of IC701.
Is the data signal output at pin 11 of RF connector when Locator key on the base unit is pressed ?
Yes
No
Check RF unit.
Is the data signal output at pin 23 of IC401.
Yes
No
Check around IC401.
Is the data signal output at pin 59 of IC701 ?
Yes
No
Check R728.
Does pin 24 of IC701 become LOW when a signal is input ?
Yes
No
Check RF unit.
Check around IC701.

23.9. No Link (Base Unit TX)


Does the TALK LED flash when the Handset/ Locator key is pressed ?
Yes
No
Check around Locator key and IC701.
Is the data output of the base unit from pin 97 of IC701 ?
Yes
No
Is pin 25 of IC701 become LOW when a signal is input ?
Yes
No
Check RF unit.
Is there a data at pin 1 of RF unit ?
Yes
No
Check IC701.
Check C420, R419, R408 and VR401.
Check RF unit.

23.10. Call ID Problems

Did bell ring? (Message indicator blinks)
NO → Check C116, C115, C117, R120, R121, R122, Q106 and R123.
OK → Check IC701.

Check point
① Is pin ⑥④ of IC701 input the bell signal?

YES ↓

Was Caller ID signal (Ⓐ) sent between 1st bell and 2nd bell between Tip and Ring?
NO → Caller ID service was not sent from the Central office. (Contact for Caller ID was not made, or you are not in a service area.)

YES ↓

Is pin 41 of IC701 sent the signal (Ⓐ)?
NO → **Check point**
① Check C101, C102, R106, R107, R716 and C712.

YES ↓

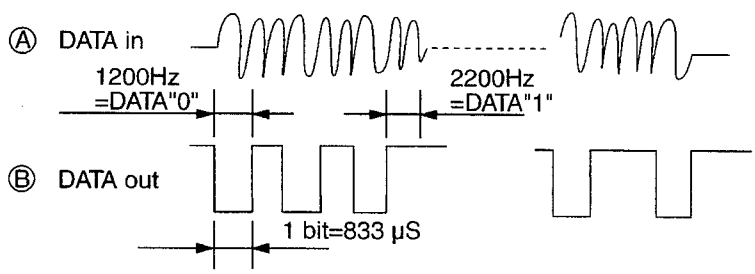
Is pin 97 of IC701 sent the signal (Ⓑ)?
NO → **Check point**
① Check IC701.

YES ↓

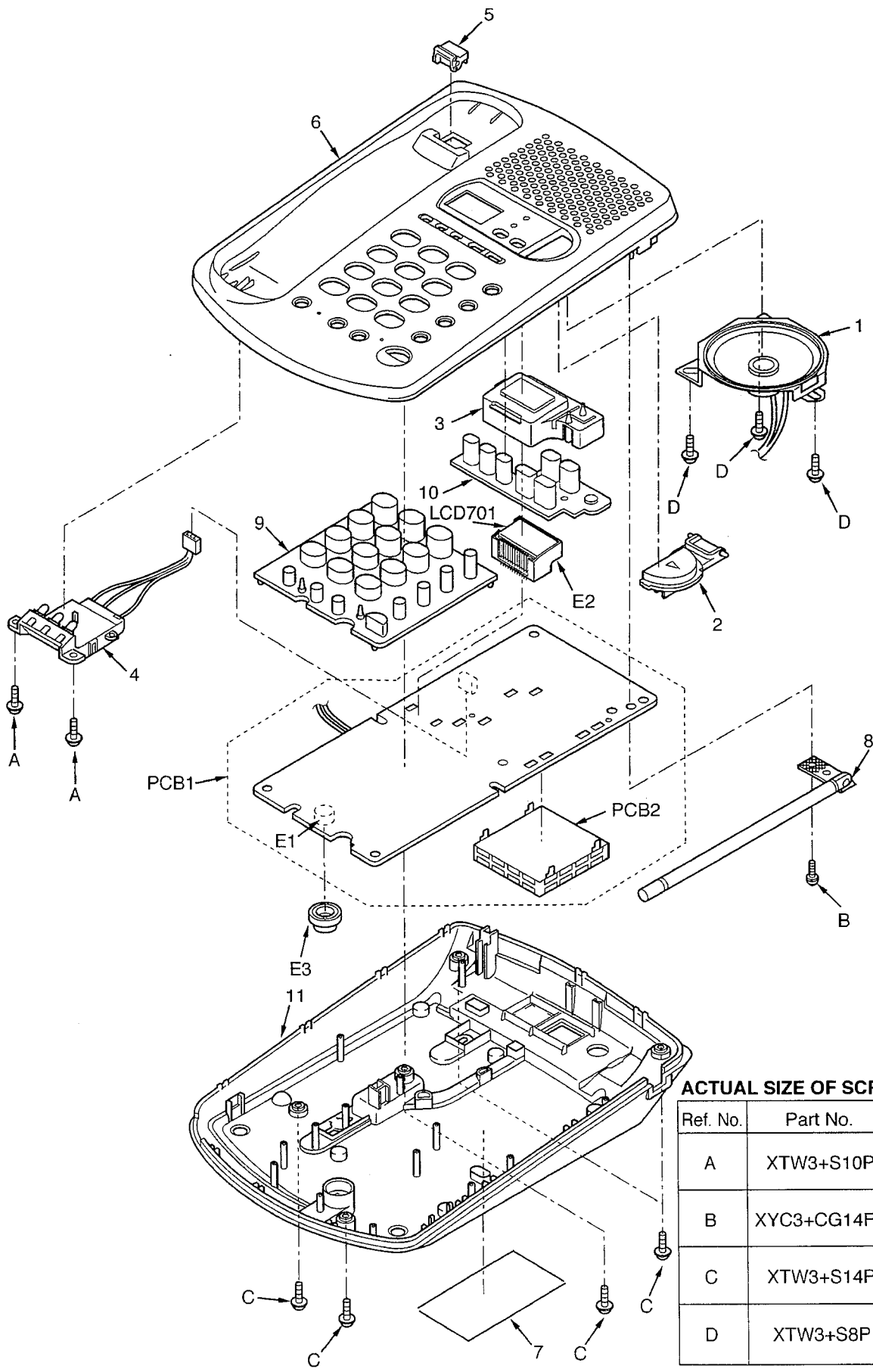
Is there a data at pin 1 of RF unit?
NO → **Check point**
① Check C420, R419, R408 and VR401.

YES ↓

Check RF unit.



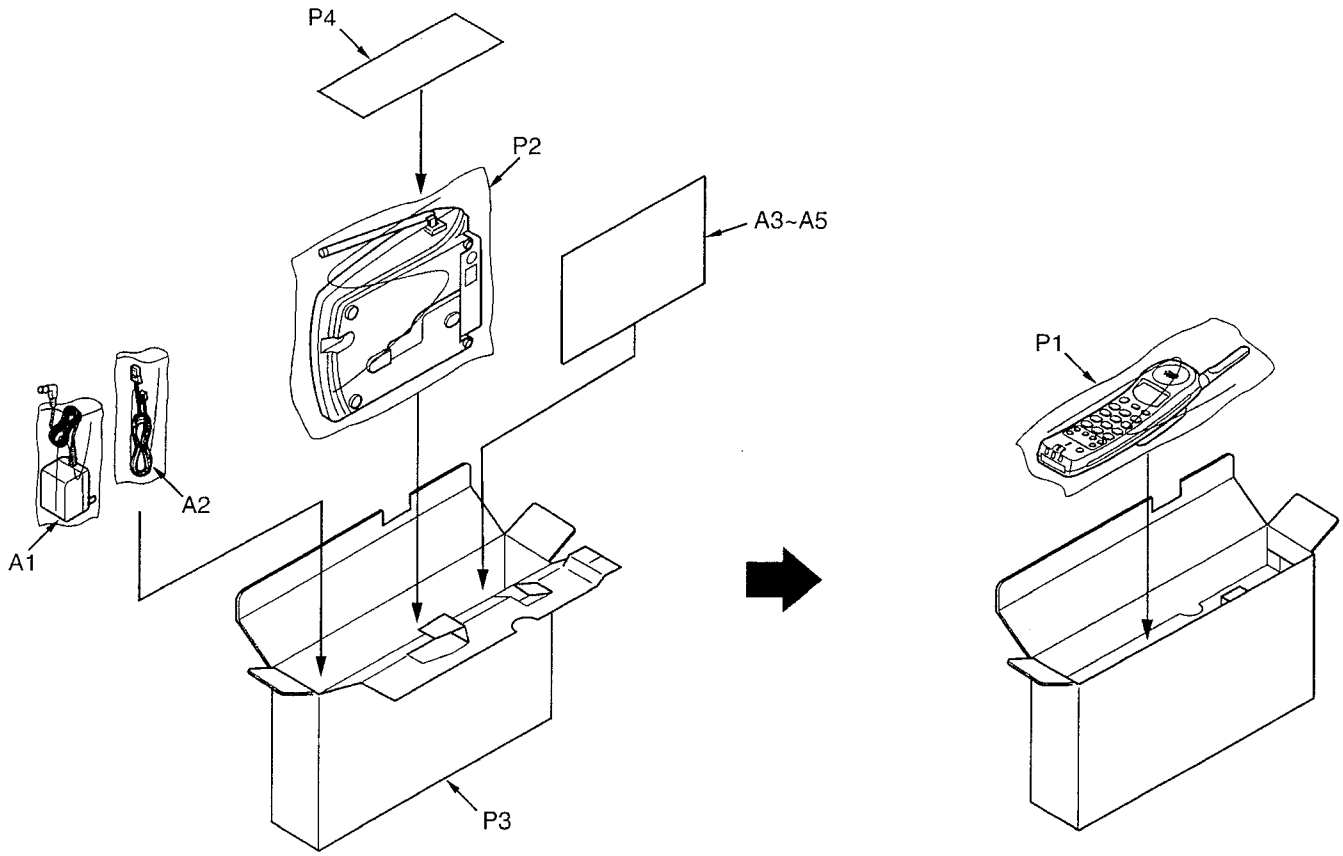
24 CABINET AND ELECTRICAL PARTS (Base Unit)



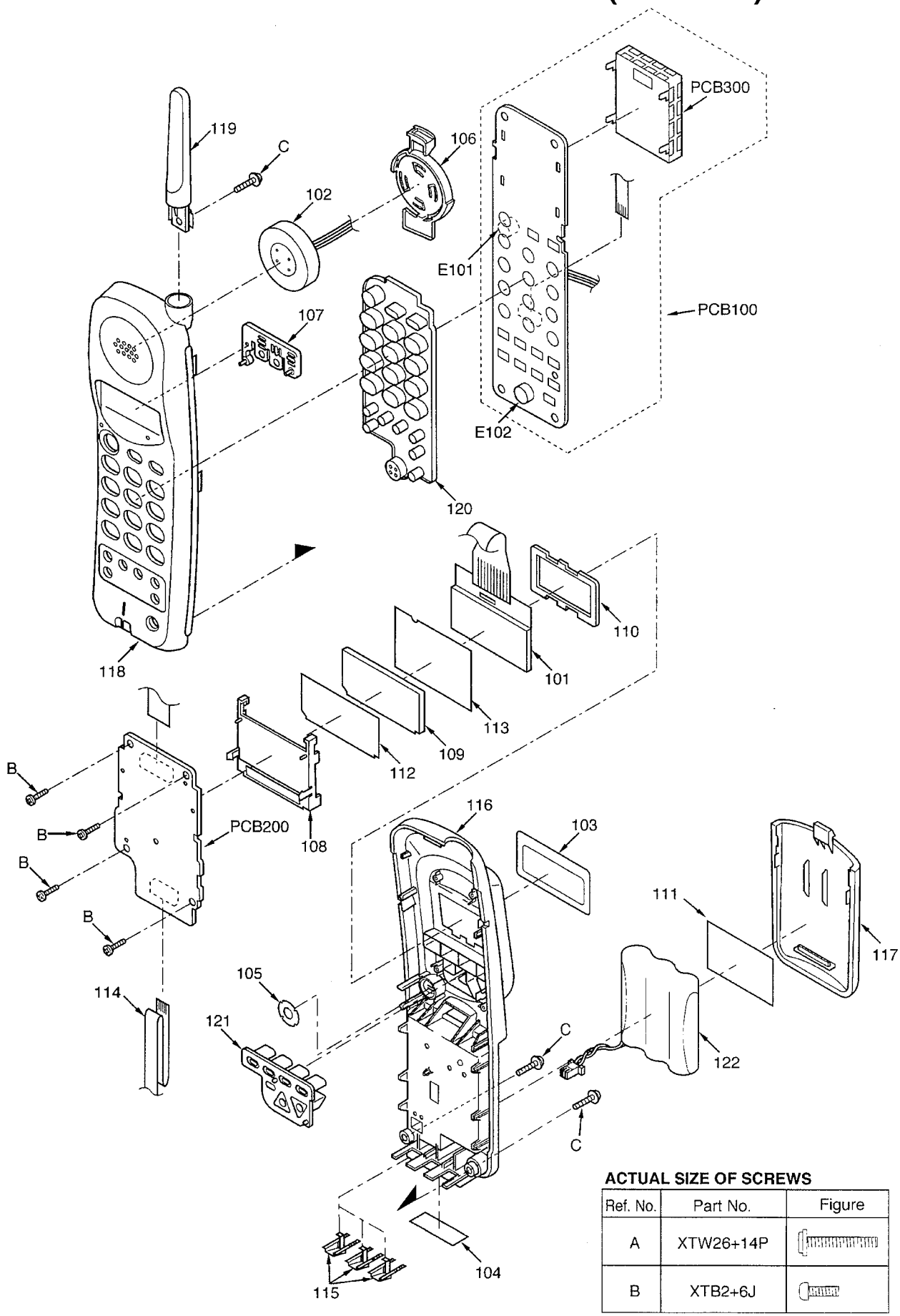
ACTUAL SIZE OF SCREWS

Ref. No.	Part No.	Figure
A	XTW3+S10P	
B	XYC3+CG14FX	
C	XTW3+S14P	
D	XTW3+S8P	

26 ACCESSORIES AND PACKING MATERIALS



25 CABINET AND ELECTRICAL PARTS (Handset)



ACTUAL SIZE OF SCREWS

Ref. No.	Part No.	Figure
A	XTW26+14P	
B	XTB2+6J	

27 REPLACEMENT PARTS LIST

This replacement parts list are U.S.A. version only. Refer to the simplified manual (cover) for other areas.

Note:

1. RTL (Retention Time Limited)

   The marking (RTL) indicates that the Retention Time is limited for this item.

   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention.

   After the end of this period, the assembly will no longer be available.

2. Important safety notice

   Components identified by a ⚠ ; mark special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

3. The S mark indicates service standard parts and may differ from production parts.

4. RESISTORS & CAPACITORS

   Unless otherwise specified;

   All resistors are in ohms (Ω) K=1000Ω, M=1000kΩ

   All capacitors are in MICRO FARADS (μF) P=μμF

   *Type & Wattage of Resistor

Type

ERC:Solid ERD:Carbon PQRD:Carbon	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Carbon ERS:Fusible Resistor ERF:Cement Resistor

Wattege

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor ECQS:Styrol PQCUV:Chip ECQMS:Mica	ECCD,ECKD,ECBT,PQCBC:Ceramic ECQE,ECQV,ECQG:Polyester ECEA,ECSZ:Electlytic ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H:50V 2A:100V 2E:250V 2H:500V	05:50V 1:100V 2:200V	0F:3.15V 1A:10V 1V:35V 0J:6.3V	0J :6.3V 1A :10V 1C :16V 1E,25:25V	1V :35V 50,1H:50V 1J :63V 2A :100V

27.1. Base Unit

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND ELECTRICAL PARTS	
1	PQAS57P03Y	SPEAKER	
2	PQBC10271Z1	"BUTTON, NEW MESSAGE "	S
3	PQGP10148Y1	LCD PANEL	S
4	PQJT10151X	BATTERY TERMINAL	⚠
5	PQKE10082Z1	HANGER	S
6	PQKM10360W1	UPPER CABINET	S
7	PQQT11795Z	CAUTION LABEL	
8	PQSA10080Y	ANTENNA	
9	PQSX10091Z	KEYBOARD SWITCH	
10	PQSX10096Z	KEYBOARD SWITCH	
11	PQYF10142S1	LOWER CABINET	S
		MAIN P. C. BOARD PARTS	
PCB1	PQWPTC1740BH	MAIN P. C. BOARD ASSY (RTL)	
		(ICS)	
IC301	PQVIL7806D2T	IC	
IC401	AN6137SB	IC	
IC701	PQVI16559AAD	IC	
IC702	PQWITCM422HM	IC ASSY	
		(TRANSISTORS)	
Q101	2SA1625	TRANSISTOR(SI)	
Q102	PQVT2N6517CA	TRANSISTOR(SI)	
Q103	2SD601R	TRANSISTOR(SI)	S
Q105	2SC2120	TRANSISTOR(SI)	
Q106	2SD601R	TRANSISTOR(SI)	S
Q301	2SD601R	TRANSISTOR(SI)	S
Q303	UN5113	TRANSISTOR(SI)	
Q311	2SD2136	TRANSISTOR(SI)	
Q312	2SD1994A	TRANSISTOR(SI)	
Q313	2SD1991A	TRANSISTOR(SI)	
Q700	2SD601R	TRANSISTOR(SI)	S
Q720	2SD1819A	TRANSISTOR(SI)	
Q751	UN5213	TRANSISTOR(SI)	S
Q752	2SD1819A	TRANSISTOR(SI)	
		(DIODES)	
D101	PQVDS1ZB40F1	DIODE(SI)	S
D102	MA4180	DIODE(SI)	S
D105	MA153	DIODE(SI)	
D106	MA4020	DIODE(SI)	
D301	PQVDMZJ6R2	DIODE(SI)	
D303	PQVDS5688G	DIODE(SI)	
D304	PQVDS5688G	DIODE(SI)	
D305	1SS119	DIODE(SI)	
D306	MA4300	DIODE(SI)	
D311	MA4300	DIODE(SI)	
D312	MA4300	DIODE(SI)	
D313	MA4300	DIODE(SI)	
D401	1SS119	DIODE(SI)	
D700	MA153	DIODE(SI)	
D701	MA111	DIODE(SI)	
D702	MA111	DIODE(SI)	
D703	MA8051	DIODE(SI)	
D704	MA8051	DIODE(SI)	

KX-TC1740B

Ref. No.	Part No.	Part Name & Description	Remarks
D710	MA111	DIODE(SI)	
D711	MA111	DIODE(SI)	
D750	MA8039	DIODE(SI)	
D801	MA111	DIODE(SI)	
D802	MA111	DIODE(SI)	
D900	MA723	DIODE(SI)	
D901	PQVDS5688G	DIODE(SI)	
		(LEDS)	
LED701	PQVDPY1112H	LED	S
LED702	PQVDSML210LT	LED	
LED703	PQVDSML210LT	LED	
LED704	PQVDSML210LT	LED	
		(COILS)	
L101	PQLQXF330K	COIL	
L102	PQLQXF330K	COIL	
L302	PQLQXF100K	COIL	
L303	PQLQXF100K	COIL	
L304	PQLQR2KA213T	COIL	
L311	PQLQXF330K	COIL	
L312	PQLQXF330K	COIL	
L313	PQLQXF330K	COIL	
L700	PQLQR2KA213T	COIL	
L701	PQLQR2KA213T	COIL	
L702	PQLQR2KA213T	COIL	
L801	PQLQR2M3N3K	COIL	
		(SURGE ABSORBERS)	
SA101	PQVDDSS301L	SURGE ABSORBER	
SA102	PQVDDSS301L	SURGE ABSORBER	
		(VARIABLE RESISTORS)	
VR401	EVN5ESX50B54	VARIABLE RESISTOR	
VR402	EVN5ESX50B24	VARIABLE RESISTOR	
		(OTHERS)	
CN101	PQJJ2H003Z	"JACK, TEL"	
CN301	PQJP03B70Z	CONNECTOR	
E1	PQJM122Z	MICROPHONE	
E2	PQHR10655Z	LCD HOLDER	
E3	PQMG10023Z	MIC SPACER	
LCD701	PQADHT3447TR	LCD	
PO101	PQRPAR390N	THERMISTOR	S
X701	PQVCK4096N9Z	CRYSTAL OSCILLATOR	

Ref. No.	Part No.	Part Name & Description	Remarks
		(RESISTORS)	
R101	ERDS2TJ825	8.2M	
R102	PQ4R10XJ335	3.3M	S
R103	PQ4R10XJ473	47K	S
R104	ERJ3GEYJ104	100K	
R105	ERDS2TJ472	4.7K	
R106	PQ4R10XJ394	390K	S
R107	PQ4R10XJ394	390K	S
R108	ERJ3GEYJ125	1.2M	
R109	PQ4R10XJ472	4.7K	S

Ref. No.	Part No.	Part Name & Description	Remarks
R113	ERJ3GEYJ182	1.8K	
R114	PQ4R10XJ820	82	S
R115	ERDS1TJ330	33	S
R117	PQ4R10XJ102	1K	S
R118	PQ4R10XJ153	15K	S
R120	ERJ3GEYJ154	150K	
R121	PQ4R10XJ154	150K	S
R122	ERJ3GEYJ682	6.8K	
R123	ERJ3GEYJ473	47K	
R124	PQ4R10XJ153	15K	S
R125	ERJ3GEYJ182	1.8K	
R301	PQ4R10XJ563	56K	S
R302	PQ4R10XJ561	560	S
R306	ERJ3GEYJ104	100K	
R311	ERJ3GEYJ122	1.2K	
R312	ERJ3GEYJ473	47K	
R313	ERDS2TJ103	10K	
R314	ERDS2TJ331	330	
R315	ERDS2TJ680	68	
R316	ERDS2TJ680	68	
R317	ERDS2TJ680	68	
R318	PQ4R10XJ682	6.8K	S
R319	ERJ3GEYJ104	100K	
R321	PQ4R10XJ274	270K	S
R401	ERJ3GEY0R00	0	
R402	ERJ3GEY0R00	0	
R403	ERJ3GEYJ101	100	
R404	ERJ3GEYJ101	100	
R405	ERJ3GEYJ102	1K	
R406	ERJ3GEY0R00	0	
R407	ERJ3GEYJ103	10K	
R408	ERJ3GEY0R00	0	
R410	ERJ3GEYJ333	33K	
R412	ERJ3GEYJ153	15K	
R413	ERJ3GEYJ333	33K	
R414	ERJ3GEYJ473	47K	
R415	ERJ3GEYJ334	330K	
R416	ERJ3GEYJ333	33K	
R417	ERJ3GEYJ153	15K	
R418	ERJ3GEYJ153	15K	
R419	ERJ3GEYJ224	220K	
R422	ERJ3GEYJ223	22K	
R430	ERJ3GEY0R00	0	
R700	ERJ3GEYJ391	390	
R701	ERJ3GEYJ104	100K	
R702	ERJ3GEYJ122	1.2K	
R703	ERJ3GEYJ681	680	
R704	ERJ3GEYJ681	680	
R705	ERJ3GEYJ122	1.2K	
R706	ERJ3GEYJ105	1M	
R707	ERJ3GEYJ563	56K	
R708	ERJ3GEY0R00	0	
R709	ERJ3GEYJ564	560K	
R710	ERJ3GEYJ474	470K	
R711	ERJ3GEYJ104	100K	
R712	ERJ3GEYJ474	470K	
R714	ERJ3GEYJ562	5.6K	
R715	ERJ3GEYJ392	3.9K	

Ref. No.	Part No.	Part Name & Description	Remarks
R716	ERJ3GEYJ564	560K	
R717	ERJ3GEYJ224	220K	
R718	ERJ3GEYJ103	10K	
R719	ERJ3GEYJ222	2.2K	
R720	ERJ3GEYJ104	100K	
R721	ERJ3GEYJ104	100K	
R722	ERJ3GEYJ104	100K	
R723	ERJ3GEYJ222	2.2K	
R724	ERJ3GEYJ332	3.3K	
R725	ERJ3GEYJ102	1K	
R726	ERJ3GEYJ102	1K	
R727	ERJ3GEYJ102	1K	
R728	ERJ3GEYJ102	1K	
R729	ERJ3GEYJ471	470	
R731	ERJ3GEYJ104	100K	
R732	ERJ3GEYJ104	100K	
R733	ERJ3GEYJ104	100K	
R734	ERJ3GEYJ104	100K	
R737	ERJ3GEYJ332	3.3K	
R738	ERJ3GEYJ103	10K	
R739	ERJ3GEYJ103	10K	
R740	ERJ3GEYJ102	1K	
R749	ERJ3GEYJ104	100K	
R750	ERJ3GEYJ223	22K	
R751	ERJ3GEYJ563	56K	
R752	ERJ3GEYJ474	470K	
R753	ERJ3GEYJ102	1K	
R755	ERJ3GEYJ392	3.9K	
R756	ERJ3GEYJ105	1M	
R757	ERJ3GEYJ104	100K	
R758	ERJ3GEYJ221	220	
R759	ERJ3GEYJ221	220	
R760	ERJ3GEYJ221	220	
R761	ERJ3GEYJ221	220	
R762	ERJ3GEYJ221	220	
L703	PQ4R10XJ000	0	
L704	PQ4R10XJ000	0	
J700	ERJ3GEY0R00	0	
J701	ERJ3GEY0R00	0	
J702	ERJ3GEY0R00	0	
J703	ERJ3GEY0R00	0	
J704	ERJ3GEY0R00	0	
J705	PQ4R18XJ000	0	
J706	PQ4R18XJ000	0	
J707	ERJ3GEY0R00	0	
J800	ERJ3GEY0R00	0	
J803	ERJ3GEY0R00	0	

Ref. No.	Part No.	Part Name & Description	Remarks
		(CAPACITORS)	
C101	PQCUV1H681JC	680P	S
C102	PQCUV1H681JC	680P	S
C103	ECKD2H681KB	680P	S
C104	ECKD2H681KB	680P	S
C105	PQCUV1E104MD	0.1	S
C106	PQCUV1H563KB	0.056	
C107	ECEA1CKS100	10	S
C108	ECEA1HKS3R3	3.3	S
C111	PQCUV1H103KB	0.01	

Ref. No.	Part No.	Part Name & Description	Remarks
C112	PQCUV1H331JC	330P	
C113	PQCUV1H101JC	100P	
C115	PQCUV1H104ZF	0.1	S
C116	PQCUV1H104ZF	0.1	S
C117	ECUV1A474KBV	0.47	
C118	ECUV1H333KDV	0.033	S
C120	ECUV1H102KBV	0.001	
C121	ECUV1C104ZFV	0.1	
C122	ECUV1H102KBV	0.001	
C302	ECEA1AU221	220	S
C303	ECEA1AU101	100	
C304	ECEA0JU102	1000	
C305	ECEA1CKS100	10	S
C307	PQCUV1C105ZF	1	
C308	PQCUV1H102J	0.001	S
C309	ECUV1H103KBV	0.01	S
C313	PQCUV1C105ZF	1	
C314	ECUV1A105ZFV	1	
C315	PQCUV1H103ZF	0.01	
C402	ECUV1C104KBV	0.1	
C405	ECEA1CKS220	22	S
C406	ECEA1CKS220	22	S
C407	ECUV1C104KBV	0.1	
C408	ECEA1CK101	100	S
C409	ECUV1C104KBV	0.1	
C410	ECUV1C104KBV	0.1	
C411	ECUV1C224ZFV	0.22	
C412	ECEA1VKS4R7	4.7	S
C413	ECUV1H102KBV	0.001	
C414	ECUV1H222KBV	0.0022	
C415	ECEA1HKS2R2	2.2	S
C416	ECUV1H152KBV	0.0015	
C417	ECUV1H682KBV	0.0068	
C418	ECEA1VKS4R7	4.7	S
C419	ECUV1C104KBV	0.1	
C420	ECUV1C104KBV	0.1	
C421	ECUV1H682KBV	0.0068	
C422	ECUV1H472KBV	0.0047	
C423	ECUV1C104KBV	0.1	
C425	ECUV1C104KBV	0.1	
C701	ECUV1C104ZFV	0.1	
C702	ECUV1C104ZFV	0.1	
C703	ECUV1H100DCV	10P	S
C704	ECUV1H100DCV	10P	S
C705	ECUV1C104ZFV	0.1	
C707	ECUV1C104ZFV	0.1	
C708	EECFM5R5473	0.047	
C709	ECUV1C104KBV	0.1	
C710	ECUV1C104KBV	0.1	
C711	ECUV1H101JCV	100P	
C712	ECUV1H820JCV	82P	
C713	ECUV1H221JCV	220P	
C714	PQCUV1C224ZF	0.22	S
C715	PQCUV1C224ZF	0.22	S
C716	ECUV1C563KBV	0.056	
C717	ECUV1H331JCV	330P	
C718	ECUV1C104KBV	0.1	
C719	ECUV1A105ZFV	1	

Ref. No.	Part No.	Part Name & Description	Remarks
C720	PQCUV1E473MD	0.047	S
C721	PQCUV1C224ZF	0.22	S
C722	ECUV1C104ZFV	0.1	
C723	ECUV1A105ZFV	1	
C724	ECUV1C104ZFV	0.1	
C726	ECUV1C104ZFV	0.1	
C730	ECUV1A105ZFV	1	
C731	ECUV1H103KBV	0.01	S
C732	ECEV0JA101	100	
C733	ECUV1C104KBV	0.1	
C734	ECUV1C104KBV	0.1	
C751	ECUV1H101JCV	100P	
C752	ECUV1H101JCV	100P	
C753	ECUV1H101JCV	100P	
C754	ECUV1H101JCV	100P	
C755	ECUV1H101JCV	100P	
C756	ECUV1H101JCV	100P	
C758	PQCUV1C105ZF	1	
C761	ECUV1H101JCV	100P	
C763	ECUV1H101JCV	100P	
C764	ECUV1H101JCV	100P	
C766	ECUV1H101JCV	100P	
C767	ECUV1H562KBV	0.0056	
C768	ECUV1H102KBV	0.001	
C800	ECUV1C104ZFV	0.1	
C801	ECKDRS102MB	0.001	⚠
C802	ERJ3GEY0R00	0	
C811	ECUV1H102KBV	0.001	
C813	ECUV1C104ZFV	0.1	
C814	ECUV1C104ZFV	0.1	
C816	ECUV1C104ZFV	0.1	
PCB2	PQLZ10006Z	RF P. C. BOARD ASSY (RTL)	

27.2. Handset

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND ELECTRICAL PARTS	
101	LNY153C01	LCD	
102	PQAX3P23Z	SPEAKER	
103	PQGP10144Z1	LCD PANEL	S
104	PQGT13713Z	NAME PLATE	
105	PQHG10527Y	SPACER	
106	PQHR10639Z	SP HOLDER	
107	PQHR10640Y	LED LENSE	
108	PQHR10642Z	LCD HOLDER	
109	PQHR10643Z	LCD PLATE	
110	PQHS10378Z	LCD CUSHION	
111	PQHS10383Z	SHEET	
112	PQHX10859Z	REFLECTION PLATE	
113	PQHX10860Z	REFLECTION PLATE	
114	PQJE10094Z	LEAD WIRE	
115	PQJT10150Z	BATTERY TERMINAL	
116	PQKF10297W1	REAR CABINET	S
117	PQKK10089Z1	BATTERY COVER	S
118	PQKM10365X3	FRONT CABINET	S
119	PQSA10083Z	ANTENNA	
120	PQSX10092X	"BUTTON, 12KEY"	
121	PQSX10093Z	"BUTTON, 6KEY"	
122	PQXA36SVC	BATTERY	S
		MAIN P.C.BORD PARTS	
PCB100	PQWP1C1740BR	MAIN P. C. BOARD ASSY (RTL)	
		(ICS)	
IC201	AN6139FA	IC	
IC901	MN101C10AKC	IC	
		(TRANSISTORS)	
Q201	PQVTD123T146	TRANSISTOR(SI)	S
Q202	PQVTD123T146	TRANSISTOR(SI)	S
Q203	2SD1819A	TRANSISTOR(SI)	
Q204	2SD1819A	TRANSISTOR(SI)	
Q901	PQVTDTC143E	TRANSISTOR(SI)	
		(DIODES)	
D201	PQVDPTZTE25	DIODE(SI)	S
D202	MA8150	DIODE(SI)	
D203	MA111	DIODE(SI)	
D204	MA736	DIODE(SI)	
D212	MA111	DIODE(SI)	
D901	MA728	DIODE(SI)	S
		(LEDS)	
LED901	PQVDSML310MT	LED	
LED903	PQVDSML310MT	LED	
LED904	PQVDSML310MT	LED	
LED905	PQVDSML310MT	LED	
LED906	PQVDSML310MT	LED	
LED907	PQVDSML310MT	LED	
		(CONNECTORS)	
CN202	PQJP2D13Z	CONNECTOR	
CN701	PQJS19B11Z	CONNECTOR	
CN702	PQJS22B11Z	CONNECTOR	
		(OTHERS)	
E101	PQEFBDB111GF	BUZZER	
E102	PQJM122Z	MICROPHONE	
X901	PQVCL3276N9Z	CRYSTAL OSCILLATOR	

Ref. No.	Part No.	Part Name & Description	Remarks
		(RESISTORS)	
R201	ERJ3GEYJ221	220	
R202	ERJ3GEYJ332	3.3K	
R203	ERJ3GEYJ103	10K	
R204	ERJ3GEYJ120	12	
R205	ERJ3GEYJ393	39K	
R206	ERJ3GEYJ123	12K	
R207	ERJ3GEYJ104	100K	
R208	ERJ3GEYJ222	2.2K	
R209	ERJ3GEYJ563	56K	
R210	ERJ3GEYJ104	100K	
R211	ERJ3GEYJ153	15K	
R212	ERJ3GEY0R00	0	
R213	ERJ3GEYJ103	10K	
R214	ERJ3GEYJ100	10	
R215	ERJ3GEYJ153	15K	
R217	ERJ3GEYJ220	22	
R218	ERJ3GEYJ103	10K	
R219	ERJ3GEY0R00	0	
R220	ERJ3GEYJ103	10K	
R221	ERJ3GEYJ101	100	
R223	ERJ3GEYJ102	1K	
R224	ERJ3GEYJ333	33K	
R228	ERJ3GEYJ333	33K	
R229	ERJ3GEY0R00	0	
R231	ERJ3GEYJ330	33	
R232	ERJ3GEYJ273	27K	
R233	ERJ3GEYJ273	27K	
R234	ERJ3GEYJ823	82K	
R235	ERJ3GEYJ104	100K	
R240	ERJ3GEYJ153	15K	
R241	ERJ3GEYJ222	2.2K	
R251	ERJ3GEYJ333	33K	
R254	ERJ3GEYJ222	2.2K	
R271	ERJ3GEY0R00	0	
R272	ERJ3GEY0R00	0	
R274	ERJ3GEYJ103	10K	
R701	ERJ3GEYF434	430K	
R702	ERJ3GEYF824	820K	
R703	ERJ3GEYJ101	100	
R704	ERJ3GEYJ101	100	
R705	ERJ3GEYJ101	100	
R707	ERJ3GEYJ104	100K	
R708	ERJ3GEYJ104	100K	
R901	ERJ3GEYJ102	1K	
R902	ERJ3GEYJ334	330K	
R903	ERJ3GEYJ331	330	
R906	ERJ3GEYJ331	330	
R907	ERJ3GEYJ331	330	
R908	ERJ3GEYJ105	1M	
R909	ERJ3GEYJ331	330	
R910	ERJ3GEYJ101	100	
R911	ERJ3GEYJ101	100	
R912	ERJ3GEYJ331	330	
R913	ERJ3GEYJ105	1M	

Ref. No.	Part No.	Part Name & Description	Remarks
R914	ERJ3GEYJ102	1K	
R915	ERJ3GEYJ102	1K	
R917	ERJ3GEYJ331	330	
R919	ERJ3GEYJ100	10	
R920	ERJ3GEYJ101	100	
R921	ERJ3GEYJ102	1K	
R922	ERJ3GEYJ101	100	
R923	ERJ3GEYJ104	100K	
J700	ERJ3GEY0R00	0	

Ref. No.	Part No.	Part Name & Description	Remarks
		(CAPACITORS)	
C202	PQCUV1E104MD	0.1	S
C203	ECUV1H101JCV	100P	
C204	ECUV1H103KBV	0.01	
C205	ECUV1H103KBV	0.01	
C206	ECST0JY106	10	
C208	ECUV1H103KBV	0.01	
C209	ECEA1CKS470	47	S
C210	ECUV1C104KBV	0.1	
C212	ECUV1H103KBV	0.01	
C213	ECUV1C104KBV		
C214	ECUV1H472KBV	0.0047	
C216	ECUV1H103KBV	0.01	
C217	ECUV1C683KBV	0.068	
C218	ECUV1H103KBV	0.01	
C219	ECUV1H103KBV	0.01	
C220	ECUV1H182KBV	0.0018	
C221	ECUV1C104ZFV	0.1	
C223	ECUV1C683KBV	0.068	
C224	PQCUV1C474ZF	0.47	
C225	ECST0JY106	10	
C226	ECEA0JKA331	330	
C228	ECUV1H682KBV	0.0068	
C231	ECUV1C104KBV	0.1	
C232	PQCUV1C105ZF	1	
C233	ECUV1C104KBV	0.1	
C234	PQCUV1C105ZF	1	
C235	PQCUV1C105ZF	1	
C236	PQCUV1C474ZF	0.47	
C237	PQCUV1C105ZF	1	
C238	ECUV1H101JCV	100P	
C239	ECUV1C104ZFV	0.1	
C240	ECUV1H471JCV	470P	
C242	ECUV1C104ZFV	0.1	
C244	ECUV1H472KBV	0.0047	
C247	ECUV1C104KBV	0.1	
C251	ECUV1H822KBV	0.0082	
C259	ECUV1C104KBV	0.1	
C262	ECUV1C104ZFV	0.1	
C268	ECUV1H080DCV	8P	

Ref. No.	Part No.	Part Name & Description	Remarks
C269	MQLRE18NJF	COIL	
C271	ECUV1C104ZFV	0.1	
C901	ECUV1C104ZFV	0.1	
C902	ECUV1C104KBV	0.1	
C904	PQCUV1E104MD	0.1	S
C905	ECEA0JK221	220	S
C906	ECUV1H180JCV	18P	
C907	ECUV1H180JCV	18P	
C908	ECUV1C104ZFV	0.1	
C909	ECUV1A105ZFV	1	
C910	ECUV1H100DCV	10P	
C911	ECUV1H100DCV	10P	
C270	ERJ3GEY0R00	0	
PCB300	PQLZ10005Z	RF P. C. BOARD ASSY (RTL)	

27.3. KX-TC1740B

Ref. No.	Part No.	Part Name & Description	Remarks
		ACCESSORIES	
A1	PQLV1Z	AC ADAPTOR	⚠
A2	PQJA10075Z	TEL CORD	
A3	PQQW12103Z	QUICK REFERENCE GUIDE (English)	
A4	PQQW12104Z	QUICK REFERENCE GUIDE (Spanish)	
A5	PQQX12186Z	INSTRUCTION BOOK	
P1	XZB10X35A02	PROTECTION COVER (for Handset)	
P2	PQPP170Z	PROTECTION COVER (for Base Unit)	
P3	PQPK12769Z	GIFT BOX	
P4	PQPD10426Z	CUSHION	